

# **The American Journal of Pharmaceutical .... Education ....**

---

---

**THE OFFICIAL PUBLICATION OF THE AMERICAN  
ASSOCIATION OF COLLEGES OF PHARMACY**

---

---

**"If pharmacy is to be what pharmacy aims to be, then there must be much thinking, thinking that is dangerous to those whose thinking is of pharmacy of the dead past rather than of pharmacy of the dynamic present."—Edward C. Elliott**

---

---

***Volume XIII***

***April, 1949***

***Number 2***

---

---

# INSTITUTIONS HOLDING MEMBERSHIP IN THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

## Alabama

Alabama Polytechnic Institute,  
School of Pharmacy, Auburn.  
(1905)\*  
Lynn S. Blake, Dean

## California

University of California, College of  
Pharmacy, San Francisco. (1942)  
Troy C. Daniels, Dean  
University of Southern California,  
College of Pharmacy, Los Angeles.  
(1918)  
Alvah G. Hall, Dean

## Colorado

University of Colorado, College of  
Pharmacy, Boulder. (1921)  
Charles F. Poe, Dean

## Connecticut

University of Connecticut, College  
of Pharmacy, New Haven. (1935)  
Harold G. Hewitt, Dean

## District of Columbia

George Washington University,  
School of Pharmacy, Washington.  
(1900)  
Charles W. Bliven, Dean  
Howard University, College of  
Pharmacy, Washington. (1926)  
Chauncey I. Cooper, Dean

## Florida

University of Florida, College of  
Pharmacy, Gainesville. (1925)  
Perry A. Foote, Dean

## Georgia

Southern College of Pharmacy,  
Inc., Atlanta. (1948)  
R. C. Hood, Dean  
University of Georgia, School of  
Pharmacy, Athens. (1928)  
Kenneth L. Waters, Dean

## Idaho

Idaho State College, College of  
Pharmacy, Pocatello. (1927)  
Eugene O. Leonard, Dean

## Illinois

University of Illinois, College of  
Pharmacy, Chicago. (1900)  
Earl R. Series, Dean

## Indiana

Butler University, College of Phar-  
macy, Indianapolis. (1927)  
Edward H. Niles, Dean  
Purdue University, School of  
Pharmacy, Lafayette. (1901)  
Glenn L. Jenkins, Dean

## Iowa

Drake University, College of Phar-  
macy, Des Moines. (1942)  
Russell E. Brillhart, Dean  
State University of Iowa, College  
of Pharmacy, Iowa City. (1901)  
Rudolph A. Kuever, Dean

## Kansas

University of Kansas, School of  
Pharmacy, Lawrence. (1900)  
J. Allen Reese, Dean

## Kentucky

University of Kentucky, College of  
Pharmacy, Louisville. (1900)  
Earl P. Stone, Dean

## Louisiana

Loyola University, New Orleans  
College of Pharmacy, New Orleans.  
(1921)  
John F. McCloskey, Dean  
Xavier University, College of Phar-  
macy, New Orleans. (1923)  
Lawrence F. Ferring, Dean

## Maryland

University of Maryland, School of  
Pharmacy, Baltimore. (1900)  
B. Olive Cole, Acting Dean

## Massachusetts

Massachusetts College of Pharmacy,  
Boston. (1900)  
Howard C. Newton, Dean

## Michigan

Detroit Institute of Technology,  
College of Pharmacy and Chem-  
istry, Detroit. (1923)  
Esten P. Stout, Dean  
Ferris Institute, College of Phar-  
macy, Big Rapids. (1938)  
Ralph M. Wilson, Dean  
University of Michigan, College  
of Pharmacy, Ann Arbor. (1900)  
Charles H. Stocking, Acting Dean  
Wayne University, College of Phar-  
macy, Detroit. (1925)  
Roland T. Lakey, Dean

## Minnesota

University of Minnesota, College  
of Pharmacy, Minneapolis. (1901)  
Charles H. Rogers, Dean

## Mississippi

University of Mississippi, School  
of Pharmacy, Oxford. (1913)  
Elmer L. Hammond, Dean

## Missouri

St. Louis College of Pharmacy and  
Allied Sciences, St. Louis. (1900)  
Arthur F. Schlichting, Dean  
University of Kansas City, School  
of Pharmacy, Kansas City. (1948)  
Theodore T. Dettrich, Dean

## Montana

State University of Montana,  
School of Pharmacy, Missoula.  
(1917)  
Curtis H. Waldon, Dean

\* Denotes year institution was admitted to the Association.



# THE AMERICAN JOURNAL

## OF

### PHARMACEUTICAL EDUCATION

**Volume XIII**

**April, 1949**

**Number 2**

#### CONTENTS

Recent Adventures in Accreditation— <i>Edward C. Elliott</i>	253-262
Implementation Is Not Automatic— <i>Edward C. Elliott</i>	263-270
To Be or Not To Be— <i>Robert P. Fischelis</i>	271-275
The Profession of Pharmacy as Viewed by an Educator— <i>J. Hillis Miller</i>	276-284
The World Awaits You— <i>Robert P. Fischelis</i>	285-303
Teaching the Chemistry of Organic Medicinal Products— Didactic Instruction— <i>LeRoy C. Keagle</i>	304-308
Laboratory Instruction in the Chemistry of Organic Medicinal Products— <i>Ole Gisvold</i>	309-320
A Discussion of "Laboratory Instruction in the Chemistry of Organic Medicinal Products— <i>Haakon Bang</i>	321-325
The Scope and Content of an Undergraduate Course or Courses in Organic Pharmaceutical Chemistry— <i>Henry S. Johnson</i>	326-332
Discussion on the Scope and Content of an Undergraduate Course or Courses in Organic Pharmaceutical Chemistry — <i>Joseph D. Matthes</i>	333-335
The Present Status of Pharmacognosy and Its Proper Place in the Pharmacy Curriculum— <i>Kenneth Redman</i>	336-354
Remembering Lima—A Travelogue— <i>Georgianna Simmons Gittinger</i>	355-357
The Precedents of the N.A.R.D. and Its Founding Fifty Years Ago— <i>George Urdang</i>	358-375
Fifty Years of History of the University of Texas College of Pharmacy— <i>Carl Clarence Albers</i>	376-385
An Editorial—Pharmacy and the American Association of University Women— <i>Zada M. Cooper</i>	386-387
The President's Page	388-389
The Editor's Page	390-394
Notes and News	395-405
Miscellaneous Items of Interest	406-408
Book Reviews	409-412

Published quarterly by the American Association of Colleges of Pharmacy at Lincoln 8, Nebraska. (Jacob North & Co.) Subscription price \$4.00. Single copies \$1.00. Entered as second class matter July 1, 1937, at the postoffice at Lincoln 8, Nebraska, under the Act of August 24, 1912.

Editorial Office: College of Pharmacy, University of Arizona, Tucson, Arizona. Address all communications to the Editor.

## Officers and Executive Committee 1948-1949.

### PRESIDENT

J. LESTER HAYMAN.....*Morgantown, West Virginia*

### VICE PRESIDENT

J. ALLEN REESE.....*Lawrence, Kansas*

### SECRETARY - TREASURER

LOUIS C. ZOPF.....*Iowa City, Iowa*

### PRESIDENT ELECT FOR 1949 - 1950

B. V. CHRISTENSEN.....*Columbus, Ohio*

### EXECUTIVE COMMITTEE

JOSEPH B. BURT, Chairman..1949....*Lincoln, Nebraska*

HOWARD C. NEWTON.....1949....*Boston, Massachusetts*

GEORGE E. CROSSEN.....1949....*Corvallis, Oregon*

R. BLACKWELL SMITH, JR.....1950....*Richmond, Virginia*

NOEL F. FOSS.....1950....*Chicago, Illinois*

RUFUS A. LYMAN, EDITOR.....*Tucson, Arizona*

ARTHUR H. UHL, Past President,.....*Madison, Wisconsin*

J. LESTER HAYMAN, President.....*Morgantown, West Virginia*

LOUIS C. ZOPF, Secretary-Treasurer.....*Iowa City, Iowa*

B. V. CHRISTENSEN, President-Elect.....*Columbus, Ohio*

Member Ex-Officio, without vote

### HONORARY MEMBER

ZADA M. COOPER.....*Villisca, Iowa*

# The American Journal of Pharmaceutical Education

## THE PUBLICATION BOARD

RUFUS A. LYMAN  
Chairman and Editor

Secretary

LOUIS C. ZOPF

George E. Crossen

Arthur H. Uhl

Noel F. Foss

J. Lester Hayman

Joseph B. Burt

R. Blackwell Smith, Jr.

Howard C. Newton

## COLLABORATORS

Airston, Margaret	University of Southern California
Albers, C. C.	University of Texas
Alstodt, Berl S.	Long Island University
Aponte, Jose	Ferris Institute
Barrett, Leslie B.	University of Connecticut
Benson, Simon	Wayne University
Bliven, Charles W.	George Washington University
Brecht, Edward A.	University of North Carolina
Cataline, Elmon L.	University of Michigan
Chamberlin, N. T.	Western Reserve University
Cole, B. Olive	University of Maryland
Crandall, J. Verne	Detroit Institute of Technology
Cwalina, Gustav E.	Purdue University
Eidsmoe, Clark T.	South Dakota State College
Eiler, John J.	University of California
Emch, Bess G.	University of Toledo
Galloway, J. Earle	Drake University
Geiler, Frederick L.	West Virginia University
Hallinan, Gertrude M.	Columbia University
Hargreaves, George W.	Alabama Polytechnic Institute
Hoehn, Willard A.	University of Kansas City

Hood, R. C.	Southern College of Pharmacy, Georgia
Ireland, Edward J.	Loyola University
Jones, James W.	State University of Iowa
Johnson, Carl H.	University of Florida
Johnson, William W.	University of Mississippi
Kaufman, Karl L.	Medical College of Virginia
Kelly, Charles J.	Xavier University
Klotz, Lyell J.	University of Cincinnati
Kramer, John E.	Philadelphia College of Pharmacy & Science
Martin, Lewis E.	University of Illinois
Melendez, Esteban N.	University of Puerto Rico
Miller, Clifton E.	North Dakota Agricultural College
Mollett, Charles E. F.	State University of Montana
Morrison, Robert W.	University of South Carolina
Musick, Albert H.	University of Tennessee
Nelson, John W.	The Ohio State University
Netz, Charles V.	University of Minnesota
O'Brien, J. Francis	Albany College of Pharmacy
Ohmart, Leslie M.	Massachusetts College of Pharmacy
O'Toole, William C.	Duquesne University
Parkinson, Ramona	University of Colorado
Prout, William A.	Medical College of the State of South Carolina
Raabe, Rudolph H.	Ohio Northern University
Reese, J.. Allen	University of Kansas
Rising, L. Wait	University of Washington
Rist, Walter	St. Louis College of Pharmacy
Rivard, W. Henry	Rhode Island College of Pharmacy
Rowe, Edward J.	Butler University
Rowland, Ivan	Idaho State College
Schwarting, Arthur E.	University of Nebraska
Sciuchetti, Leo A.	Oregon State College
Slone, Earl P.	University of Kentucky
Sonnedecker, Glenn A.	University of Wisconsin
Sprague, C. Henry	Creighton University
Spowls, Joseph B.	Temple University
Ulan, Martin S.	New Jersey College of Pharmacy
Valenzuela, Patracinio	University of the Philippines
White, Alfred J.	Fordham University
White, Allen I.	State College of Washington
Wilson, Robert C.	University of Georgia
Wilson, Stephen	University of Pittsburgh

## Recent Adventures in Accreditation\*

EDWARD C. ELLIOTT

Director of The Pharmaceutical Survey

### I

This, as many of you will recall with mixed reactions, is my fourth appearance, as representative of The Pharmaceutical Survey, before the annual meeting of the American Association of Colleges of Pharmacy: Pittsburgh, 1946; Milwaukee, 1947; San Francisco, 1948, now comes the valedictory of Jacksonville, 1949.

With the accumulated events of the years, there is a natural temptation to recall and to review the statements made in Pittsburgh of the original plans and anticipations of the Survey; to re-examine the accounts of the progress of the first year presented in Milwaukee; and to re-assess the worth of the designs for the future of pharmacy projected in San Francisco. But time is a relentless master of ceremonies. What has been said before, and the record of what has been done is already a part of the archives of pharmacy. And the records stand in spite of the realization that erasures and revisions are indicated by the experience of the passing days.

The present commission does not include any responsibility or opportunity to survey the Survey as a whole. This will be my task at the general session of the American Pharmaceutical Association on Thursday morning.

### II

It will be remembered that The Pharmaceutical Survey was planned as a two-stage enterprise. The first of these

---

\*Read before the Second Session of the American Association of Colleges of Pharmacy on April 25, 1949, at the Jacksonville meeting.

two stages—two years—was to be the assembly of the essential facts relating to present-day pharmacy; and the processing of these facts into the form of conclusions and recommendations designed for the conservation and the elevation of pharmacy as a profession. The second stage—the third year—was to be represented by the organized efforts to give reality and force to the programs of action indicated by the conclusions and the recommendations of the Committee on The Pharmaceutical Survey. This stage is generally referred to as the *implementation* stage of the Survey.

It is also to be remembered that these two stages were not consecutive. Indeed, it may be said that implementation began with the initiation of the Survey. The Survey was an undertaking of the field of action. It was not an enterprise to be carried out in an ivory tower. It had been conceived not as a temporary, but as a continuous, enterprise requiring the active cooperation of all of those agencies upon which the future of pharmacy depends. These agencies had to be warmed up for action.

During the course of its operation, the Survey has accumulated great stockpiles of descriptive information, statistical data, individual and group opinions relative to the wide range of American Pharmaceutical activities. Much of these stockpiles was old stuff, more or less well known and unused. All of the desired facts and material is not to be found in these stockpiles. From the beginning regular inventories showed significant lacks. Yet, with the means available, the Survey was satisfied that there were more facts than could or would be productively employed.

### III

The Survey had been under way but a few weeks when it was realized that the American Council on Pharmaceutical Education, as the designated agency for the accreditation of the institutions belonging to the education system of pharmacy, occupied a position of critical and far-reaching influ-



ence for the future of pharmaceutical education and for the profession of pharmacy. Among the first of the recommendations of the Survey were those made informally and tentatively to this Council. These had to do with the nature, the objectives and the procedures of the Council. With the complete and active cooperation of the Council—especially on the part of the lamented, wise secretary, Andrew G. DuMez—a series of recommendations were formulated, approved by the Committee on The Pharmaceutical Survey and embodied in the first published report of the Findings and Recommendations of the Survey. With these findings and recommendations the members of this Association are already familiar. Nevertheless, it is timely to place emphasis upon the key importance of certain of the proposals for Council action:

(a) The recognition and acceptance of the dual objectives of the Council; first, that of serving as the agency for the safeguarding of the educational standard and the practices of the profession; and second, that of advising, stimulating and assisting the American Association of Colleges of Pharmacy and the individual institutions and raising the prevailing minimum standards and improving the practice of pharmacy.

(b) Provisions for the financial support and the adequate staffing of the Council for the accomplishment of its educational functions.

(c) The adoption of a system of classification of accredited institutions.

#### IV

The first concrete, comprehensive, constructive result of The Pharmaceutical Survey was the grant of funds by the American Foundation for Pharmaceutical Education for the operation of the Council during the current year. In this connection it is to be noted that the whole of pharmacy should appreciate the conspicuous service already rendered, and being rendered, by this Foundation. The conception of the Foundation and its accomplishments constitute a decisive event in the modern history of American pharmacy.

## V

For this meeting I have chosen to offer, as the targets for your attention, some of the ideas, impressions and experiences gained as a representative of the American Council on Pharmaceutical Education during the recent accreditation examinations of the colleges and schools of pharmacy. In more ways than one these examinations revealed the opportunities and the difficulties of implementing the results and recommendations of the Survey.

Since December last, eighteen institutions have been examined. Of these, fourteen were re-examinations and four first examinations. The schedule for the present academic year includes three more institutions for re-examination.

Disregarding the physical punishment of extended, continuous travel, I may truthfully say that these visitations of the colleges and schools represent the high point of my pharmaceutical career. I am convinced had I been wisely farsighted I would have spent the entire first year of the Survey in studying pharmaceutical education, as it is, at close range.

## VI

The first and most vivid impression gained from these accreditation examinations is that of the helpful attitude and hopeful outlook of the deans and staffs of the colleges and the schools, and of the principal administrative officers of the institutions of which these colleges and schools are integral parts. In view of the current reaction against various accrediting agencies, it was most gratifying to note that at no time and at no institution was there to be observed any resentment or criticism of the program and policy of the American Council on Pharmaceutical Education. On the contrary, there was every evidence of a desire and an intention of cooperating with the Council in its efforts for the upgrading of professional education for pharmacy.

## VII

My present main purpose is neither to praise the Council, nor to defend the theory and practice of accreditation of professional training institutions. Rather, I would speak of things more directly related to the primary business of the institutions you represent. *That primary business is the effective teaching of competent students in order that they may be fully qualified humanely, scientifically, practically and spiritually for the practice of pharmacy as a profession.*

As some of you here know, I have been far more concerned with what goes on in your classrooms and laboratories than I have been with the details of the mass of information called for by the accreditation application forms of the Council.

## VIII

It is certain that most of you would be surprised, and some of you irritated, were you to see the two signal words used as headings for my present notes. These are: JUMBLE and MUMBLE. These are not mere trick words. They are intended to serve as hooks upon which to hang the stuff of your recall of what is here said.

## IX

May it be repeated that the primary business of the colleges and schools of pharmacy is the effective teaching of capable students. This involves what is taught, and in what sequence, by whom taught, to whom taught, how taught and for what purpose. At the risk of being considered a mere gadfly, may I say that the second vivid impression of the recent institutional visitation is that of the amount of drab and uninspired teaching. It may take some of you a long time to forgive me for this harsh conclusion. Within the limits of this program I am able to present a partial specification and justification.

## X

*THE JUMBLE*

When I began informally to visit the institutions more than three years ago, the lack of any organic unity in the organization and the objective functioning of the pharmaceutical curriculum was evident. Awareness of this lack has been sharpened by the recent experiences. It has been most disturbing to see the little real progress being made in the direction of the modernization and vitalization of the subject matter of instruction. The *Pharmaceutical Syllabus*, with all of its recognized limitations, appears to be the accepted code for the content and scope of pharmaceutical teaching. In altogether too many places, the curriculum is to be described as a disjointed, chance collection of teaching stuff.

The problem has been stated in the first Findings and Recommendations of The Pharmaceutical Survey:

"It is of the utmost importance that the standards, procedures and services of the Council (The Council on Pharmaceutical Education) be such as to protect and to promote the responsible freedom of each institution for advancing the cause of pharmaceutical education."

It is my seasoned conclusion that the immediate and inescapable task of each of the colleges and schools of pharmacy is that of providing its ability to have and to hold a "responsible freedom." In no way may this proof be more convincingly furnished than by compounding its own curriculum without the incompatibilities now weakening the instructional prescription. Only thus will the prime hazard of institutional accreditation, that is, institutional regimentation be avoided.

## XI

*THE MUMBLE*

In the journal of one of my darkest days of the Survey appears the following note: "The teaching staffs engage in

too much lecturing and too little teaching, contain too few scientists and too many soothsayers, too few scholars and too many sciolists, too few teachers who are modern pharmacists and too many pharmacists who are not modern teachers." Reading this later caused me to want to delete it from my confidential record. However, there was an element of truth in its nasty form, and perhaps accounts for another of the vivid impressions gained from the visitation of scores of pharmacy classrooms. Rarely did I see and hear a classroom performance, carried on by one who had a clearly planned job for the hour, who spoke clearly and simply, who displayed an appreciation of the students' difficulty of receiving and absorbing massive doses of purported facts. Too often the so-called lecture was a vocal mutilation of the material to be found in a standard textbook which the student himself could read more quickly and less painfully. It is the teacher who breathes life into the curriculum. Pharmacy today needs more teachers who know more than they teach, and who are aware that the superior teacher is a dramatic artist. Coming recently from the classroom of one of these dramatic artists, one of the students said to me: "No one ever goes to sleep in this class." Speaking frankly, I have witnessed too much sleeping sickness in the pharmaceutical classrooms.

The latest observations of the teaching and learning phenomena of the pharmaceutical classrooms and laboratories convince me that the time—usually two days—now allotted for an institutional examination is altogether too brief. Four days would be the minimum necessary to permit visitations of at least one class of each teacher, followed by personal conferences with the teacher. My records show clearly that much of the significant material relative to the teaching problems of an institution came through the conference with teachers; in many instances more significant material than that furnished by the Dean.

## XII

The inventory of my accreditation impressions includes one other item of significance. When the plans for the re-examination of the colleges and schools were being made, it was proposed that the examining committees include one or more representatives of the State Board of Pharmacy of the state in which the institution is located. This was done, and with gratifying outcomes for the institutions and the Board members participating.

As I now view the situation, the pharmaceutical structure of each state rests upon a tripod—one leg of which is the educational institution, one the State Board of Pharmacy, and one the State Pharmaceutical Association. The experience of recent weeks inclines me to recommend to the Council that in addition to the representation of the State Board of Pharmacy the accreditation examining committees include an official representative of the State Association.

## XIII

It was my hope to escape being drawn into any further arguments about the length of the period of the education and training for the profession of pharmacy *yet to be*. However, certain sharply-edged comments have reached me since arriving in Jacksonville that seem to call for treatment.

It is being said that in an address before one of the national organizations, I stated that the present four-year curriculum was ample for the preparation of the pharmacist. That is only partly correct. Those who are using this statement fail to include my qualifying words ". . . ample for the preparation of the pharmacist, *as pharmacy now is.*"

From the very beginning it has been assumed by the Survey that pharmacy aspired to a higher professional plane—that it was to be something more than a vocational satellite of a commercial sun—that those who were fully qualified for



professional rank would be more than mere peddlers of profit-producing packages.

Nothing has happened during the past three years to destroy my confidence that pharmacy is destined to occupy its rightful, higher place in the company of the professions of health. On several occasions during recent weeks, I have been reminded of those, who a generation ago protested high-school qualification for admission to the study of pharmacy, of those who resisted the extension of the periods of collegiate training from two to three years, and from three to four years. The present issue is crystal clear. Will pharmacy be content to serve as a mere underling to commerce? For one, I am confident that pharmacy will not be so content.

#### XIV

Among my minor diversions and means of escape from the drudgery of the days, is an interest in baseball and the personalities that make baseball a great American game. This by way of explanation of my attention a few weeks ago to an item appearing on the sport page of an Arizona newspaper.

The manager of the world champion Cleveland Indians was asked about the prospects for his one-time prize pitcher, Bob Feller. "He thinks too much," replied Boudreau. "That may seem funny for most of us don't think enough, but when you give Bob an assignment he doesn't consider it just a job to be done. He has to think about the heat and humidity and what happened when he pitched under the same conditions last year. In other words, unless conditions are just right Bob feels in advance he can't do his best. Of course that's the wrong attitude. He has to meet conditions as they are and not hope that the conditions will meet his special requirements."

As I finished reading this sport item, there came to mind the Shakespearian scene. Looking at the lean and hungry

Cassius, Julius Ceasar told Anthony, "He thinks too much. Such men are dangerous."

If pharmacy is to be what pharmacy aims to be then there must be much thinking, thinking that is dangerous to those whose thinking is of pharmacy of the dead past rather than of pharmacy of the dynamic present.

---

## New in the Family

**George Victor Leonards.** Born November 1, 1948, son of Dr. and Mrs. J. R. Leonards, Western Reserve University.

**John Ronald Youngken.** Born February 22, 1949, son of Dr. and Mrs. Heber W. Youngken, Jr., University of Washington.

**Theresa Linda Garcia.** Born February 22, 1949, daughter of Mr. and Mrs. Roberto Garcia, first great granddaughter of Dr. and Mrs. R. A. Lyman, University of Arizona.

**Linda Susan Byrum.** Born March 4, 1949, daughter of Dr. and Mrs. Woodrow R. Byrum, University of Arizona.

**Suzanne Lynne Cataline.** Born January 24, 1949, daughter of Dr. and Mrs. E. L. Cataline, University of Michigan.

**Chié Susan Higuchi.** Born December 30, 1948, daughter and third child of Dr. and Mrs. Higuchi, University of Wisconsin.

**Carl Wayne Albers.** Born February 11, 1949, son of Mr. and Mrs. Clarence Albers, first grandchild of Dr. and Mrs. C. C. Albers, University of Texas.

**William Arthur Benica.** Born December 27, 1948, son of Dr. and Mrs. William S. Benica, Medical College of Virginia.

**Ann Tomkies Becker.** Born January 24, 1949, second daughter of Dr. and Mrs. Charles A. Becker, University of Florida.

**John Marvin Duckworth.** Born February 27, 1949, first child of Prof. and Mrs. Frank A. Duckworth, University of Florida.

**Gregory Krupski.** Born March 2, 1949, son of Dr. and Mrs. Edward Krupski, University of Washington.

**Robert Edward Burckhalter.** Born March 26, 1949, second son of Dr. and Mrs. J. H. Burckhalter, University of Kansas.

**Eric David Holck.** Born April 8, 1949, son of Mr. and Mrs. Alfred Holck, first grandson of Dr. and Mrs. H. G. O. Holck, University of Nebraska.

## Implementation Is Not\* Automatic\*

EDWARD C. ELLIOTT

Director, The Pharmaceutical Survey

### I.

#### PRELIMINARY

In one of the accounts of the career of his paper-made character—Scattergood Baines—the American storyteller, Clarence Budington Kelland, refers to a community where a man is never fired from a job; he is never discharged, and he never quits. The whole thing is handled by the diplomatic phrase "*He got through.*"

When I received the command-request from Secretary Fischelis to provide him with a title for the part assigned to me for this session of the American Pharmaceutical Association, the case of Scattergood Baines came to mind. The title "*The Survey is Through. Is Pharmacy Through With the Survey*" was proposed. The Secretary apparently considered this as a bit crude. He preferred polysyllabic wording appearing on the printed program. However, we were separated in thought merely by our common language. We had the same idea. This may be expressed in yet another form—*The Survey is ended, but the Survey is not finished.*

The argument of this morning has to do with some of the aspects of finishing the job.

### II.

#### TRIAL BALANCE

As might be expected, at the time when it is about to close its operations, the Survey has been preparing a schedule

---

\*Read before the General Session of the American Pharmaceutical Association at the Jacksonville meeting, April 28, 1949.

of the various debits and credits entered on the record during the past three years—a form of trial balance. This is neither the time nor the place to present such a trial balance in all of its detail. It is timely, though, to remind you of certain of the more important of the items appearing in the debit and credit columns.

### *Survey Debits*

The Pharmaceutical Survey, as an over-all study and analysis of pharmaceutical education, practices and services, would not have been possible had not American pharmacy provided three prime essentials:—a keen *consciousness*, on the part of the leadership, of the critical present and future of the profession; ready *cash* for the practical conduct of the Survey; and whole-hearted *cooperation* by the rank and file of the profession. Each of these represents a major Survey debit. It is expected that the final report of the Survey will take proper account of the services rendered; and without which the accomplishments of the Survey, large or small as these may be, would have been impossible.

Here and now, a special acknowledgment should be made of the continued and understanding support of the American Foundation for Pharmaceutical Education. Not once did the officers and directors of the Foundation fail to come to the assistance of the Survey as new and unforeseen situations and needs developed. The conception and accomplishments of the Foundation must be considered as decisive events in the modern history of American pharmacy.

Then, too, pharmacy has been placed under a permanent indebtedness to the members of the Committee on the Pharmaceutical Survey. During nearly a score of lengthy sessions of the Committee I witnessed the utilitarian idealism of the profession in action. The voluntary, vigorous and vital service of this Committee constitutes an under-scored debit of the Survey; and a capitalized credit to the profession and to the American Council on Education under whose auspices the Survey was carried on.

### *Survey Credits*

Standing at the head of the column of entries on the credit side of the trial balance is the operating policy of the Survey. Broken down, this policy contained, among others, these three principal items. *First*, the Survey determined to refrain from "popping off" about its own accomplishments, or broadcasting the recognized weaknesses of pharmacy as it is today; *second*, the focusing of attention upon those areas wherein the known facts clearly indicated good chances of effecting prompt betterments; and, *third*, the beginning of the task of implementing the results of the Survey, with whoever, wherever, and whenever the facts had been processed into a working plan.

Next in the credit column come the several reports, thus far completed, published and distributed. These are:

#### *A. Findings and Recommendations of the Pharmaceutical Survey, 1948.*

This report, as you well know, presents the origin, plans and aims of the Survey, a significant statement of the common understandings of the Committee, and a series of eleven sets of proposals for action. These relate to:

1. The supply of and demand for trained pharmacists—professional manpower record.
2. The American Council on Pharmaceutical Education
3. The teaching staffs
4. Student selection, guidance and testing
5. State Boards of Pharmacy—organization, financial support and function.
6. State Boards of Pharmacy—examinations for licensure
7. State Boards of Pharmacy—practical experience requirements for licensure
8. The financing of pharmaceutical education
9. The prescription study
10. The pharmaceutical curriculum
11. In-service training for pharmacists

*B. The Prescription Study*

This report just issued, was prepared under the direction of Mr. J. Solon Mordell, and contains a comprehensive and detailed analysis of more than thirteen thousand prescriptions gathered by the Survey in the autumn of 1946. It is believed that this is the most thorough study of physicians' prescriptions ever made.

*C. The Abilities and Interests of Pharmacy Freshmen*

A monograph, prepared by Dr. H. H. Remmers and Dr. N. L. Gage, and containing the results of the predictive testing of students entering colleges and schools of pharmacy in 1946.

There is now being printed a second monograph containing the results of further personnel studies of students of pharmacy, and an analysis of the examinations for licensure given by state boards of pharmacy.

Then, there is the so-called Blue Book, now being put into final form for printing, and to include the principal factual data upon which the already published findings and recommendations are based, together with a series of studies made of a number of the special aspects of pharmaceutical organization and retail practice. This, it is hoped, will be printed and distributed before autumn.

Finally, it is hoped that ways and means will be found for the completion and publication of an inclusive report on curricula of the colleges and schools of pharmacy being prepared by Dr. L. E. Blauch of the United States Office of Education.

III

*IMPLEMENTATION ALREADY A FACT*

Long experience had given me an awareness of the constant danger that the Pharmaceutical Survey would re-



sult in a printed report, and little more. Consequently, the Survey regarded itself, not as a short-time, but as a long-time enterprise. It was not an affair to be carried on within any isolated ivory tower. It was an undertaking of the field of action. Any constructive and permanent results would come from the understanding, the interest and the actions of individuals and of professional agencies upon which the future of pharmacy is dependent. Therefore, from the day the Survey began there have been daily efforts to warm up the professional engines so that they would be ready for the new Survey loads of duty.

The first stages of the implementation of some of the principal recommendations of the Survey have been wholly or partially accomplished. Evidence of this is to be found in almost every one of the many sessions of this Jacksonville conclave of pharmaceutical organizations. There is much talk. The tasks ahead are being identified, assigned and accepted. Without being overly optimistic, and not forgetting the disposition, in certain quarters, to be sharply critical of the commissions and omissions of the Survey, the Director and the members of the Committee on the Pharmaceutical Survey, are greatly encouraged by the discussions and actions taking place.

Pharmacy, through the American Pharmaceutical Association, the National Association of Boards of Pharmacy, the American Association of Colleges of Pharmacy, the National Association of Retail Druggists, individual state boards of pharmacy, individual colleges and schools of pharmacy, individual state pharmaceutical associations and The American Council on Pharmaceutical Education, is reacting in ways that represent determination to promote the forward and upward movements of the profession. Pharmacy is already indicating that it expects to do its own hard work with its own hands and its own heads.

It may easily be that some of the recognized problems cannot be solved by the formulas presented by the Survey.

Even so, pharmacy, without doubt, will proceed to develop other formulas that will serve to solve the problems that are problems.

In my crystal globe I see during the days immediately ahead a Commission on Professional Manpower for Pharmacy, organized and in effective operation; a Council on Pharmaceutical Education adequately staffed and supported for the necessary services; a nation-wide campaign for providing the colleges and schools with improved teaching personnel; plans in operation for securing students of high ability and high ambition to be educated and trained for the profession; a national convention for pharmacy legislation; long-needed betterment of the state board examinations for licensure; a reformation of the prevailing impractical, practical experience requirement for licensure; the strengthening of the financial structure for pharmaceutical education; an unceasing attack of the never completely solved problem of the best instructional program designed to fit young men and women to serve as competent and respected representatives of the profession; and the fashioning of effective machinery to give an ever-increasing number of practicing pharmacists opportunity for continuous study as a means for qualifying, day by day, as modern pharmacists.

Will pharmacy continue to work at these tasks? The answer is with such as you and your successors. May it ever be remembered, though, that: "*No great deed is done by falterers who ask for certainty.*"

#### IV

#### *HINDSIGHT AND FORESIGHT*

No one more than I knows the limitations and lacks of the Pharmaceutical Survey. Every day some individual or organization wants to know whether the Survey does not have detailed facts about this or that matter. Too frequently the Survey has not attempted to get data of the

sort desired. Too frequently the inquirer is inclined to raise his eyebrows and, now and then, his voice. All I can say is, "What's done is done, what's not done is not done."

Of this I am certain. The findings and recommendations already published contain a program for constructive work that will consume much of the collective energy of the profession for the next decade. The great question is whether the needed energy will be channeled and utilized for the accomplishment of the indicated objectives—objectives essential for the protection and elevation of pharmacy as a profession.

Some of the criticism of the Survey has come from those who do not seem to be aware that the Survey has been concerned primarily with *pharmacy as a profession*—pharmacy as a member of the major league of professions, and not as a member of a minor league of commercial purveyors—pharmacy, as a shining health sun and not as a mere satellite of another sun.

Here I digress long enough to say that it is most unfortunate that the proposal for the extension of the period of educational and technical qualification for pharmacy is referred to as the *six-year* curriculum. What is proposed is that those entering the colleges and schools of pharmacy shall have at least a minimum of that general education represented by two years of education on a collegiate level. The profession, if it is to be a profession of rank, must be represented by men of education as well as men of technical competency. Four additional years are not too much to acquire an understanding of the expanding pharmaceutical sciences.

Before completing its work it is expected that the Committee on the Pharmaceutical Survey will formulate and present further findings and recommendations. These, in all likelihood, will relate to, (a) the better organization of American pharmacy for concerted forward action along the

fronts of the new frontiers; (b) the need of setting up an agency for the continuous study and oversight of the forces determining the economics of the profession; and, (c) to the need of developing and implementing a new pact with the profession of medicine.

Within a few weeks my career in pharmacy will come to a close. And I shall watch from whatever place in oblivion I may be the activities of pharmacy to insure its development and survival as a major profession. From the vantage ground of my observations during the past three years, I say to you, in all seriousness, that tremendous, organized, country-wide, inclusive, unselfish efforts will be required to secure and to hold for pharmacy that status among the learned, scientific professions long aspired to by foresighted idealists. Those efforts are being made today, and will continue to be made by men of force, and men of faith in the mission of pharmacy.

## V

## POSTSCRIPT

During the week the affairs of the Survey have been discussed with a number of those who might be described as pessimistic optimists. The problems and plight of pharmacy were freely admitted; and the logic of the Survey prescriptions generally approved. Yet, how often has there been the doleful declaration, "You can lead a horse to water but you cannot make him drink"; which reminded me of the incident of the sales representative of an English concern who was endeavoring to explain his failure to secure orders. He, too, said, "Well, you can bring a horse to water, but you can't make him drink." "Drink," roared the exasperated sales manager, "who asked you to make him drink. Your job is to make him thirsty."

The Pharmaceutical Survey *has* made pharmacy thirsty. And the profession of pharmacy, I am convinced, is ready today and tomorrow to take a large portion of the elixir for an enduring life.

## To Be Or Not To Be\*

ROBERT P. FISCHELIS

Secretary and General Manager, American Pharmaceutical Association  
Washington, D. C.

### I

Pharmaceutical education has reached another intersection in its travel on the highway of progress. At the rate of speed maintained thirty years ago, it would not have reached this intersection for another decade or two. But even at its accelerated speed, pharmaceutical education is still trailing education in the other health fields.

A few months ago, the Selective Service Administration called a meeting of representatives of professions engaged in providing training in health services and in the fundamental sciences. Pharmacy was not represented because, as the director put it, "we have limited invitations to the professions whose training is at the graduate level." Regardless of the inadequacy of this explanation, it reveals a line of thought and procedure in places where it is necessary for pharmacy to be considered on a level with other professions in the health group.

In 1918, adequate recognition was withheld from pharmacy because its educational house was not in order. Its program had not reached the undergraduate college level. By 1940, this had been fully remedied but in the meantime, great progress had been made elsewhere and it was still difficult to class pharmacy with medicine, dentistry, and public health as far as educational preparation was concerned. This is due to the fact that we have been trying to combine pre-professional and professional training in the same course,

---

\*Read before the Second Session of the American Association of Colleges of Pharmacy at the Jacksonville meeting, April 25, 1949.

while the weight of opinion in educational and professional circles is against the soundness of this procedure.

I have not come to take your time to argue for or against any specific program or to rehash the arguments for or against the four or six-year program or any other program. I have come only to bring to your attention a number of cold, hard facts which make it plain that unless pharmacy selects the right direction in which to move from the intersection at which it now finds itself, it may curb its essential progress beyond repair.

## II

Many of us expected that The Pharmaceutical Survey findings and recommendations would clearly map the course for pharmaceutical education in the immediate, as well as the distant future. Perhaps this was expecting too much. All of the data on which the findings and recommendations were based have not been published as yet. But we know that there is confusion in the interpretation of the findings and the recommendations. This is very likely the result of attempts to compromise conflicting views in The Survey Committee on the meaning of the factual data uncovered.

We can be sure of one thing under any circumstances. It is that the determination of the curriculum for the course in pharmacy and the required standards of admission to the course will continue to be the responsibility of the colleges of pharmacy. Today, they are the gateway to the practice of pharmacy.

Every step taken in the past to advance pharmacy's educational program has originated with progressive and far-seeing educators. They have had the backing and co-operation of equally progressive state boards of pharmacy and practitioners of pharmacy, but the motivating influence which brought about the changes in minimum entrance requirements and in the lengthening of the professional course to four years came from the educators, as it rightfully should.



At the crossroads, we have now reached, it is necessary once more for the educators to speak up and point the way. Some have done so already and the American Association of Colleges of Pharmacy expressed itself as favoring the proposed six year program in principle last year at San Francisco.

It is necessary now to go a step further. There is an impression abroad that the action taken at San Francisco did not represent the conviction of a sufficient number of faculties of accredited colleges of pharmacy to assure any early revision of the minimum standard for admission to the American Association of Colleges of Pharmacy.

The action taken and the comment of those who have made a critical evaluation of the recommendations of The Survey, would indicate that each institution may interpret the proposal to lengthen the educational program according to its own current facilities.

This is not the way progress has been made in pharmaceutical education in the past.

Pharmaceutical education can certainly not afford to close its eyes to the developments in general education. About a year ago, a group of teachers of medicine, law, divinity, engineering and business, met in what was called an "Inter-professions Conference on Education and Professional Responsibility." This group discussed the objectives of professional education, the content and methods of professional instruction and humanistic and social education as preparation for professional responsibility and citizenship. The consensus of this group after a searching discussion of the topics on the agenda was that if professional men are to play their part in preserving the freedom and improving the character of our democracy, they must continue to learn throughout their lives from study and experience the changing character of the problems which confront society and the changing means available for solving them. It was pointed out that

professional men must learn how to apply the power of mind which they develop in professional study and work to dealing with the complex problems that confront our government. Only by thus giving of their highest powers to the public good can they maintain the effective public control that alone separates democratic bureaucracy from dictatorship. It was stressed that professional men must do all this in spite of engrossing demands of professional work.

It was concluded that to develop in students the ability and habits of mind which will equip them to assume these responsibilities of citizenship is a task which education must perform.

Among all of the professional groups in the health field, none comes as frequently into contact with the public as do pharmacists. A minimum of five billion contacts annually is the conservative estimate of those who have given this matter close study. More and more, public health agencies are recognizing the tremendous importance of the pharmacist as an educator in public health matters and as one of the leading factors in the dissemination of health information. If any of the professional groups within the health field must be possessed of a general education as well as a technical education, it is the pharmacist of the future.

The American Association of Colleges of Pharmacy must answer and answer soon the question whether this pharmacist of the future is to be or not to be a mere technician or an educated professional man or woman.

### III

The American Pharmaceutical Association is frequently called upon by other professional groups, by government agencies, and by organizations representing public opinion to give summaries of the thinking of the profession on special problems. We, therefore, try to gauge opinion within the profession by such expressions as are made publicly by its

leaders. A recent series of opinions expressed by deans of colleges of pharmacy in one of our journals shows a range of opinion extending from complete support of the longer educational program to complete opposition. In between these extremes, there are many qualified approvals and disapprovals. One can justify almost any opinion expressed in the light of the background of the individual or institution from which the statement emanates, and one can justify differences of opinion on this subject on the basis of training facilities and extent of demand for specialized functions. The least justifiable opinion and the one that does least credit to the profession is the one which argues against the extension of the educational program on the basis that it is not justified by financial returns available to a majority of those who would graduate from the longer course. When we get to the point where we base judgment on what shall be the program of education for our profession on the financial returns that come to the graduate, we can be accused of looking upon pharmacy as a trade rather than as a profession. If financial return is to be our yardstick, we ought to change the curriculum in a direction quite different from the one proposed by your Curriculum Committee which has done such an outstanding piece of work.

Let us keep our eyes on what is going on in general education today and what is being done to give those engaged in commerce and industry a basic training on which future human relations are to rely. If we do this conscientiously we will not want to handicap the pharmacists of the next decade or two by failing to take the forward step in time which will only keep us in step with progress in professional education and will, by no means, provide all of the education that will be needed by the specialists in the various phases of pharmaceutical practice.

Once more to be or not to be on the level occupied by other professions in the health field faces American pharmacy.

Once more the decision is in the hands of the pharmaceutical educators.

## The Profession of Pharmacy as Viewed by an Educator\*

J. HILLIS MILLER

President, University of Florida

It is with pleasure that I add my voice to those who welcome you to Florida. In many respects Florida belongs to all the people of the country. I have referred to it on a number of occasions as "The great American home." It is the most rapidly growing state east of the Rocky Mountains. Its population is increasing at the rate of 100,000 a year. More than three million visitors honor us with their presence every year. Within her 58,666 square miles of area she could contain the states of Maine, Vermont, New Hampshire, Connecticut and Rhode Island. I speak of geographical area only. I would not presume to imply that she could assimilate all the Republicans contained in those states.

You may be interested to have a word concerning the University of Florida. The pre-war enrollment of the University was about 3,600. It now has an enrollment of over 10,000. It is the second largest institution of higher learning in the South, eleventh in size among the land-grant colleges and universities, and fourteenth in size among the state universities. The chances are strong that we shall have an enrollment of over 11,000 in the fall of 1949.

The College of Pharmacy at the University is the seventh largest in the United States. It was established in 1923, largely through the effort of Florida pharmacists. Until recently it was classified as a school of pharmacy. It is now a college with full autonomy, and it is administered by a dean rather than by a director.

\*Read before the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy at the Jacksonville meeting, April 25, 1949.

The College of Pharmacy at the University has a well-rounded program including graduate work leading to the M. S. and Ph. D. degrees. Several of the deans, faculty members, and research workers attending this conference obtained their higher degrees at Florida. If you find it possible to visit us you will find that the College has gained 15,000 square feet of floor space within the past few months in a new addition to the Chemistry-Pharmacy Building. We have installed \$80,000 worth of new equipment. You will find a sizeable new pharmaceutical manufacturing department. The total new capital outlay for the College of Pharmacy approximates \$375,000.

Those of you who are interested in drug plants should visit the ten-acre medicinal plant garden which is actively cultivated and which we think is the best in the South and one of the best in the country. There you will find about two-hundred different species. The possibility of gathering herbs and plants from all over the tropical and subtropical world and growing them in this medicinal plant garden is unlimited. It might well serve as the source for many new discoveries as research and experimentation proceeds.

In Florida we have enjoyed splendid cooperation between the College of Pharmacy and the pharmacists of the State. This is evidenced by the Bureau of Professional Relations which was organized in 1940 in cooperation with the Board of Pharmacy, the Pharmaceutical Association, and the Florida Medical Association. The funds for operating this Bureau are supplied equally by the Florida State Board of Pharmacy and by the State. The value of the work of this Bureau is attested to by hundreds of persons.

I feel justified in affirming that I have a sincere and active interest in the professional affairs of our State and Nation. My experience in this field has been considerable. While Associate Commissioner of Education in New York State it was my responsibility to supervise the licensing of all of the people in thirteen major professions. I also had

over-all responsibility for the accreditation of professional schools, the appointment of professional boards, and the enforcement of the professional laws. I built up, during that experience, a very great appreciation for the services which are rendered by the professional people of any state.

In my opinion, the professional people have done as much to promote the health of the people, the general welfare of the people, the education of the people, and, in a very real sense of the word, the culture of the people than any other single group. Much of this contribution has been beyond what is directly and specifically related to the professional work for which professional people are primarily responsible. That is, I think, one of the highest compliments that can be paid to any professional group.

Among the professional groups the pharmacists occupy a prominent position in the community. There are very few people in a community who do not know the pharmacists by name and by reputation. They are in the spotlight practically all the time. Their opportunity for good is unparalleled. In many respects their opportunity is beyond any other professional group because the pharmacists not only serve the public but they serve all other professional groups. Consequently, the colleges of pharmacy, the boards of pharmacy, and the pharmacists themselves have a very great responsibility as well as a great opportunity. Hence, it is gratifying to learn of the cooperation of the colleges and the boards in promoting the profession.

In considering the value of professional education we cannot disregard the subject of cost. Budget makers and those who must seek legislative appropriations are very much concerned.

A few generations ago the average parent was content with primary education for his children. More recently high school education became popular. A small percentage of the graduates of high schools entered colleges and universities.



Today, stimulated by economic and social conditions, we find a wide-spread belief that a college education is necessary for a full life. This tendency has been further supported by aid to the veterans. Coeducation is also on the increase. The professions, including pharmacy, are asking for expanded curricula. Graduate schools wish more course offerings, faculty, equipment, and other necessities.

The demand for higher education has created larger extension divisions, night schools, large summer school enrollment, and junior colleges. I believe that the junior college idea will grow and play a greater part in higher education. Although they may be established independently, sooner or later the majority of them will seek support from the taxpayers as community colleges. More and more graduates of junior colleges will seek admission to colleges and universities.

From the foregoing one can see that the cost of higher education has already increased by leaps and bounds and will increase still further in the future. To what extent our economy can support higher education for millions of new students I cannot predict. We do know that the population of the United States is growing and that we will have more taxpayers. However, taxpayers are concerned and legislators are cautious. Furthermore, new governmental agencies are seeking funds and the old ones ask for more. Institutions of higher learning will have greater competition for funds. Lacking powerful lobbies their requests must be supported by sound needs, a proud alumni organization, and friends.

Since curricula builders frequently fail to consider costs I feel that this matter should be called to your attention, especially since a five-year pharmacy course has been discussed for several years and now we have before us the Findings and Recommendations of The Pharmaceutical Survey—a Survey ably directed by Dr. E. C. Elliott and well financed by your American Foundation for Pharmaceutical Education. In this we find the recommendation "that the American Association of Colleges of Pharmacy and the Am-

erican Council on Pharmaceutical Education take the necessary steps for the development and establishment of a six-year program of education and training leading to the professional degree of Doctor of Pharmacy (Phar. D.), this program to include two or more years of general education and basic science training."

We educators know that *training* for a profession also calls for an education to meet social responsibilities. We also know that there are many ramifications of pharmacy calling for wide scientific knowledge and particular skills. Unfortunately, the public judges pharmacy by the average drug store with a wide variety of merchandise and a prescription department which usually accounts for a small percentage of the business. We find in larger cities a few apothecary shops devoted entirely to preparing and dispensing drugs.

What would be the increased cost for an additional two years of college work? It would be roughly \$1,600 per graduate or \$120,000 additional cost for every class of seventy-five graduates. At the present time these figures are too high for the majority of institutions and impossible for independent colleges which run deficits and depend upon endowments and donations.

However, worthwhile progress is only made by surmounting obstacles. I hope that some institutions will be courageous and take the initial steps in developing a six-year program of education and training in pharmacy. A few of your colleges have already started five-year programs which might be a good compromise for many colleges at this time.

The development of adequate curricula for most professions is a difficult task and calls for frequent examination and evaluation in these changing times. We know that this applies to pharmacy as evidenced by The Pharmaceutical Survey.

A backward glance at pharmaceutical education in this country reveals noteworthy strides since the turn of the century, particularly during the last two decades. Two-year and three-year courses were offered by most colleges of pharmacy up to 1932 when the present standard four-year course became compulsory. Since that time we have experienced abnormal conditions, a depression, a world conflict, and now most institutions have excessive enrollments, a shortage of instructors, and are in the midst of physical expansion to meet the situation.

During these uncertain times and with the rapid advances in the sciences it is questionable whether the four-year curriculum has been brought to peak efficiency. It is my feeling that much improvement can and should be made to enable the colleges to do a better job in four years. It is far better to offer a modern four-year curriculum with emphasis upon quality, than to attempt a six-year plan without adequate support.

I am pleased to observe that The Pharmaceutical Survey recommended "that the American Association of Colleges of Pharmacy and the American Council on Pharmaceutical Education continue their efforts for the constructive betterment of the existing four-year program of education and training providing the essential knowledge and skills for the practice of pharmacy leading to the degree of Bachelor of Science in Pharmacy."

With thousands of students on our campuses, the need for adequate guidance is greater than ever. I am glad the American Association of Colleges of Pharmacy has started a program of predictive testing followed by one on achievement testing. In mass education we must do everything possible to keep the needs of the individual uppermost in our thinking.

With this in mind the University of Florida is building a student personnel program and a counselling program

along modern and progressive lines. College life, and the curriculum in particular, should develop our students into well-rounded individuals prepared to serve our society. Adequate facilities should be made available to students for the fostering of leadership and individual initiative and responsibility. The graduate should be well trained in the natural sciences and professional courses. He should have the opportunity also to explore the social sciences and the humanities. It is not enough that man understands his natural world. It is not enough that he understands himself and how he may contribute to social progress. He must go on to understand his own modes of thought, his religion, ethics, philosophy, ideas, his means of expression, his literature, and his music and art. We must educate the individual for integrity and sound judgment.

With the rapid advances in the basic sciences and in professional technology much of the knowledge imparted to students will become obsolete in a short time; therefore, curricula should stress fundamentals and the student should be taught not only how to study but also that he must continue to study after he leaves the halls of learning. It has been wisely said that it takes twenty years to make a professional man. A curriculum must be formulated and the whole college program organized to educate and train "for the shape of things to come."

I think that the great responsibility of the colleges of pharmacy and the boards of pharmacy is to maintain qualitative standards. In other words, I am firmly convinced, after a half dozen years or more in dealing with the professions, that the greatest contribution you can make to professional life is to maintain standards that cannot be questioned.

I recall an incident a few years ago when a delegation of five or six outstanding political leaders came to my office trying to persuade me to license an individual in one of the professions. I recall saying to this group: "Gentlemen,

here are our standards. If this man meets these standards, there is nothing I would rather do than give him a license. If he does not meet them, he hasn't a chance in a million."

You have to be positive in maintaining standards. A great many people will say, "Oh, it doesn't make any difference. This person ought to be allowed to get through because he is the son of so and so, and he has other good relationships." That is not the way to build a great profession.

There are two things that make a great profession. One is academic standards—those standards that have to do with preparation and ability on the part of those that practice the profession; and the other is the standard of conduct, by which the professional man renders his service to the community. Give me a profession with high ethical standards carried on simultaneously with good professional service by well-trained men and I will show you the profession that can make a great contribution to civilization. However, if you lower either one, ethics or service, in that proportion the profession short changes itself, and it short changes the people it serves.

If you are not already doing so, I strongly recommend that you add a course for under-graduates in professional ethics because I believe the college is the place to begin the business of teaching high ethical standards. The situation calls for more than that! Even though one has received that kind of training in a college of pharmacy, if one goes out into a profession that does not maintain those standards he will have a tough time of it. If, on the other hand, one so trained goes out into a profession that is going to help him maintain high professional standards then I am sure that he will make a maximum contribution to his day and generation.

The written history of pharmacy covers forty centuries with a glorious record of achievements and contributions to mankind. Your profession is now in the midst of accelerated

progress. With the discovery, production, and use of many new drugs, such as the sulfa drugs and the antibiotics, it has been estimated that greater progress in the control of serious infections has been accomplished during the last decade than in all previously recorded history. I am also impressed with the following figures for 1948—\$50,000,000 for research on drugs and \$22,000,000 for the scientific control in manufacturing them. The future will yield many new and wondrous drugs and I believe a greater and better profession of pharmacy. That I may have a part in pharmaceutical developments in the new era, I will continue my interest in your profession and lend my support to it in every possible way.

---

**The American Council on Education** has requested the **Journal** to assist in bringing to our readers next autumn the results of forthcoming Conference on the Role of Colleges and Universities in International Understanding which is to be held at Estes Park, Colorado, June 19-22, 1949. Fifty-seven educational organizations, including the American Association of Colleges of Pharmacy and the American Pharmaceutical Association, have joined with the American Council on Education in sponsoring this conference. The subjects to be presented in the preliminary studies and in the opening address for the information of the conference and for further study by special committees are stated in the agenda as follows:

1. United States Government Programs that Call for Cooperation with Colleges and Universities.
2. Programs of Intergovernmental Organizations and of Foreign Governments that Involve Cooperation with United States Colleges and Universities.
3. Programs of Voluntary Organizations that Call for Cooperation with Colleges and Universities.
4. Training for Positions Bearing on International Understanding.
5. Education for International Understanding; Understanding of International Relations; and Understanding of Other Peoples.
6. International Organization of Universities.

The American Council on Education can rest assured that the **Journal** will lend its pages to the dissemination of the results of the studies of the Conference.



## The World Awaits You\*

ROBERT P. FISCHER

Secretary and General Manager, American Pharmaceutical  
Association, Washington, D. C.

Occasions which mark the completion of some stage of the formal education of any group of young people are of special interest to the members of that group, their families, their teachers, their sweethearts and their friends. When such a group consists of young men and women who have completed their college training in medicine, dentistry, pharmacy, nursing and the arts and sciences allied or fundamental thereto, interest in their graduation extends to the world at large. This is so because people everywhere need more and more of the services which nurses, physicians, dentists, pharmacists and allied scientists have been trained to supply.

At no time have the demands for a high quality of medical care been greater. The American people have a great yearning for better health. So today's graduates are eagerly awaited and the world is anxious to put them to work.

It is well known that the scientific and professional training imparted by the faculties of the various schools and colleges of the University of Tennessee is of very high quality. These institutions are nationally accredited and their faculties possess a well earned reputation for general excellence in teaching and research.

This audience includes parents, wives and relatives who have sacrificed much to enable some of the members of the graduating classes to reach their coveted goal. And

\*Commencement address before the graduating classes in Medicine, Dentistry, Pharmacy, Nursing and Biological Sciences of the University of Tennessee, Memphis, Tennessee, December 20, 1948.

let us remember also that professional education of the quality received here could not have been possible at the prevailing student fees, if the taxpayers of the State of Tennessee and persons and organizations interested in the advancement of the medical sciences, who are philanthropically inclined, had not contributed substantial sums to the maintenance of your University.

I know that the members of the graduating classes would join me on this occasion in paying tribute to an who have helped to make it possible for them to obtain the splendid professional education which will now enable them to start on a career of service to the sick. But I shall not take time to dwell on this because I would like to speak briefly to the graduates on the kind of a world that awaits their coming and what it expects of them. I trust that others in the audience may find it not too boresome to listen in.

One need not be a confirmed pessimist to be apprehensive of world conditions in general. We have not yet been able to sign treaties of peace for the formal ending of a war which we thought had been won in 1945. We still have armies in Germany and Japan and we are preparing ourselves to meet emergencies which may threaten the survival of our democratic way of life. We have shown the world that we recognize that no nation can live unto itself alone and prosper, at a time when science has given us forms of transportation that make distance relatively unimportant and at the same time has provided weapons which can wipe out large portions of cities and populations in short order.

To offset the mad race toward possible destruction of our civilization we have joined with the other countries of the world in organizing the United Nations, but the statesmen representing the various nations in this union are having great difficulty in avoiding a rupture of friendly relations between representatives of different ideologies in the "One World" which we are trying to build.

Let me read to you part of an editorial taken from the magazine *Harper's Weekly*: "It is a gloomy moment in history. Not for many years have there been such grave problems . . . In France the political caldron bubbles with uncertainty; Russia hangs as usual, like a cloud, dark and silent, upon the horizon of Europe; while all the energies, resources and influences of the British Empire are sorely tried. It is a solemn moment, and no man can feel indifference . . . Of our troubles no one can see the end."

This editorial appeared in *Harper's Weekly* on October 10, 1857, over ninety-one years ago! I have read it to illustrate that we have survived previous international crises and so we should not be unduly pessimistic about the possibility of finding men who by sheer ability, hard work, tact and faith can lead their people from the shadows into the light.

While it is true that our relations with some foreign powers recently have been in a precarious state and the bitter wrangling reported from the meetings of the General Assembly of the United Nations has created many skeptics about the possibility of international peace and good will, it is also true that considerable progress has been made along other segments of the international front. Fifty-six nations, including Russia and the United States have united in a World Health Organization which is functioning today and which offers living proof that the quest for health is an objective, sufficiently compelling to bring about unanimity of action between forces which may be in opposition on political matters.

The World Health Organization was brought into being as a result of the International Health Conference held in New York City, June 19 to July 22, 1946 under the auspices of the United Nations. Its constitution sets forth the following principles as basic to the happiness, harmonious relations and security of all peoples:

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

"The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.

"The health of all peoples is fundamental to the attainment of peace and security and is dependent upon the fullest cooperation of individuals and States.

"The achievement of any State in the promotion and protection of health is of value to all.

"Unequal development in different countries in the promotion of health and control of disease, especially communicable diseases, is a common danger.

"Healthy development of the child is of basic importance; the ability to live harmoniously in a changing total environment is essential to such development.

"The extension to all peoples of the benefits of medical, psychological and related knowledge is essential to the fullest attainment of health.

"Informed opinion and active cooperation on the part of the public are of utmost importance in the improvement of the health of the people.

"Governments have a responsibility for the health of their peoples which can be fulfilled only by the provision of adequate health and social measures."

Surely this is a platform which gives us an insight into the far reaching effects of the quest for health on the affairs of men and nations.

This World Health Organization has taken over the international health activities of the defunct League of Nations, among whose major accomplishments may be included the promotion of unification of standards for drugs, simplification of quarantine procedures and providing international statistics on health matters. It is rapidly developing new services and techniques called for by new conditions and there is great hope that as we develop international cooperation in the prevention of diseases and

the promotion of good physical and mental health we shall continuously improve cooperation in other avenues of international relations. The work of members of the professions dealing with health and medical care therefore takes on a new significance. Not only are we called upon to prevent, cure and mitigate disease among our own people but we may become the major instrument in curing other ills of a sick world.

Coming closer to home, let us look at some figures. In World War II approximately 250,000 Americans lost their lives in combat. But approximately one million Americans die each year from chronic diseases and another half million from acute conditions. In 1945 more than 587,000 men, women and children died of diseases of the heart and blood vessels or almost twice as many as lost their lives during the entire 3½ years of World War II. This is also three times as many as die from cancer, six times as many as die from accidents, eight times as many as die from pneumonia, and eleven times as many as die from tuberculosis. There is much left to be done to solve the problems of arteriosclerosis, cancer, rheumatism, arthritis, tuberculosis, rheumatic fever, diabetes, high blood pressure, nephritis, cirrhosis of the liver, leukemia and thyroid disease to mention but a few.

It cost us two billion dollars to produce the atomic bomb. But in 1944 we spent only \$615,000 for research in diseases of the heart and blood vessels, our number one killer. In the same year thirty-one million dollars was spent for cigaret advertising.

Cancer caused the death of 166,848 individuals in 1943 and it was estimated that there were close to one million active cases in the same year. We thought enough of cancer to spend almost a million dollars on research for it. At the same time a single company spent almost nineteen million dollars for the advertisement of soap.

During the war the Office of Scientific Research and Development devoted fifteen million dollars to medical research but American business spent more than a billion dollars on wartime advertising.

These illustrations seem to indicate a lack of proper sense of values.

The President's Scientific Research Board has recently recommended an appropriation of three hundred million dollars for medical research. This is a start toward a laudable objective, but it looks very small when compared with twenty-nine billion spent on our Navy in 1945, or more than a billion dollars appropriated for the Department of Agriculture in 1946.

Here in Tennessee the infant mortality has been higher than the rate per thousand for the country as a whole. Your tuberculosis rate was third highest in the United States. You have an uneven distribution of physicians, with one county showing one per 600 persons, several others with one per 2000 persons, and one with only one physician to 8,800 population. I dare say that other professional groups are likewise unevenly distributed.

All of you are aware of the controversy which is now raging on the question of extending medical service and medical care to all of the people by means of a compulsory health insurance program. It is very unfortunate that the impression has been created over the years that this is a fight between the organized professions dealing with medical care lined up on one side and the public on the other. Medicine and allied medical professions as a class have never failed the people in providing the essential services which they are trained to give. There are obvious faults in the system employed for providing good medical care to the indigent, the medically indigent, the so-called middle classes and even to the affluent who can afford the best and most costly of everything. Such faults creep



into every humanly devised system covering any kind of service where people are involved.

By and large, the statement of representatives of organized medicine that the quality and availability of medical care in the United States of America is the best in the world, is true but that does not excuse us from improving its quality and its availability to the point of complete coverage, if it is humanly possible to do so.

Those who want to accomplish this in one fell swoop take what seems to them to be the easy way out. They tell us that bringing everyone under a compulsory health insurance system to be paid for by tax assessments will solve the problem. Yet the voice of experience warns that compulsory health insurance is not a panacea. Evidence of this comes to us from many trustworthy sources.

Actually no one can tell at this juncture what the effect of any system of compulsory health insurance might be on American medical care. But there are some things we do know. Among these are:

1. That political interference with professional practice is never wholesome.
2. That the application of the insurance principle to payment for medical care is sound.
3. That the costs of medical care are so high as to make complete service in this field prohibitive to large groups of our population.
4. That there are systems of payment for medical care in operation which relieve the strain upon individual financial resources at any given time.
5. That there is a distinct trend toward the establishment of medical centers through which the services of all professional groups in the field of medical care can be made available at reasonable costs.
6. That participation in the costs of medical care by federal, state and local government units is an established procedure which has enabled us to prevent and cure diseases and relieve the

permanently afflicted to much better effect than has been possible without such support.

7. That group practice has been beneficial to patients as well as to members of the medical and allied professions.
8. That additional hospital facilities in needy and sparsely populated communities will become available to general practitioners as the result of the Federal Hospital Survey and Construction Act.

Knowing these things, it should be possible for all who are concerned in receiving and providing good medical care to join hands and evolve a system whereby the unpredictable impact of illness may be cushioned and spread more evenly so that no one shall be denied a high quality of medical care and so that no one capable of assuming some personal responsibility in paying for this care shall escape that responsibility.

Ordinarily one might conclude that in the task of distributing medical care it is the business of the professions to provide their expert knowledge and art and leave the economics involved to others who are competent in that field. The difficulty with this line of reasoning is that the competence of the professions is carefully tested by the state, whereas the competence of those charged with the details of government is subject to no such test. Leadership in the professions is linked rather definitely to professional competence. Political leadership may be based on ability, but it may also be based merely on popularity and sometimes it is based on demagoguery. At any rate no State Board examination is required to hold political office.

It is not strange, therefore, that the professions are fearful of what has been termed "political medicine," but they should not become hysterical over threatened procedures which need never become realities if controversies of the kind referred to are settled on a sound professional, social and economic basis.

To accomplish this, the professions must cooperate with all who are interested in the broad problems of making the fruits of our researches and our skills and abilities available to all. This will not be accomplished in an atmosphere of hostility.

Full responsibility for the quality of medical care provided should be retained by the professions under any circumstances because the compulsion of our respective codes of ethics is much more effective than the law as far as the great majority is concerned.

So much for the kind of world which is ready to bid you welcome. Now a word about your expected contribution to its improvement.

You are an unusually fortunate group. For several years you have been part of a team. The coordination of education in the health professions as exemplified in this university represents a growing trend, but you have been among the pioneers. The health problems of contemporary society can be solved only through the cooperation of all specialists, institutions and organizations concerned with the health of mankind. There must be a division of labor in any field as vast as that of providing medical care. Some one has said that, "Today there is not too much specialization, but too exclusive specialization." Medicine, dentistry, pharmacy, nursing, laboratory and x-ray technology, and biological sciences are deeply inter-related and closely interwoven with public health. They cannot be practiced in tight compartments. Each must depend on the other. All are members of the same team and teamwork will carry you far.

Through popular books, magazine articles and radio talks, people are today much more health conscious than they have ever been. The Blue Cross and the Blue Shield plans of prepaid hospital and medical services have caused people to make much greater use of hospital facilities. But

there are still many who have never selected a family doctor upon whom they can call in times of emergency or visit periodically for routine examinations. When emergencies arise they rely upon friends to refer them to a physician, or they ask the nearest pharmacist for information. He is a member of the medical team I have referred to. You have been associated with him for four years or more. There are more than fifty thousand pharmacies scattered throughout the United States and more than five billion visits are made annually to these establishments by the public. The average pharmacist sees two hundred or more people daily and he sees them before as well as after they have been sick. Physicians, dentists, nurses and their co-workers see only a small fraction of this number of people and generally they see them only while they are sick or convalescing.

The outpost, or first point of contact of many laymen with the medical team I have described is the drug store. The contact may be for the purchase of a single simple remedy, or for the dispensing of a prescription, or it may be for advice.

At any rate, the pharmacist has the opportunity to give advice and modern pharmaceutical training is directed at making this advice as competent as possible. It is not the business of the pharmacist to diagnose disease or to prescribe a remedy. It is his function to direct the inquirer to the person or place where he can obtain competent advice and treatment. To do this intelligently he must know something of the functions of other members of the team and he should also be familiar with the techniques of the social worker. He must have available, lists of general practitioners and specialists. He must be familiar with the social and public health agencies that function in his city or town, and the extent of their activities. He must know enough about private and governmental medical care programs and facilities to be able to pass such

information along and to be able to direct inquirers to the proper private practitioner, clinic, or institution, depending upon circumstances.

No social agency can afford to keep local pharmacists in ignorance of its functions, and physicians, dentists, nurses and auxiliary medical personnel are well advised to keep in close touch with the community pharmacist, for, in a sense, he is looked upon as the purchasing agent in matters of medical care for the clientele which he serves. This is a growing function which has been added to that of compounding prescriptions and dispensing medicines. The rest of the medical team will find the pharmacist an indispensable member for he can appropriately suggest consultation with a physician or dentist, when he finds that some misguided individual is attempting to be his own medical adviser and is probably postponing the day of reckoning by continually trying to relieve symptoms of what may be a major ailment, with some advertised remedy.

The United States Public Health Service and State Health Departments have recognized the great value of pharmacy as a source of public health education. In cooperation with the American Pharmaceutical Association, the U. S. Public Health Service is now carrying on a campaign of education on early recognition of cancer through display material exhibited periodically in drug stores and through the distribution of education leaflets. Pharmacists thus aid materially in case finding. In the years ahead this program will be carried further to make the public aware of the value of periodic health examinations by competent physicians, thus leading to early discovery of heart disease and other degenerative ailments.

Until a year ago I would have been at a loss for something to say to a group of graduating nurses. Then I became ill enough to be hospitalized for four weeks and to require three nurses on eight hour shifts for much of that time. Now I know a lot about good and bad nursing and a little more about nurses.

It would be helpful to the entire medical care program if some of us had an occasional opportunity to judge the quality of medical care dispensed from the consumer's standpoint. You actually have to be sick and hospitalized to understand the human reactions to the things professional people do or leave undone in the course of their professional practice.

The frontiers of the nursing profession have been extended considerably since the days of Florence Nightingale. As the division of labor goes on in the field of medical care, the college trained and graduate nurse becomes an ever more important factor in the extension of medical services. At the right hand of the physician in the most critical stages of illness her devotion to the patient is often a prime factor in his recovery. Serving as a medically trained member of the team, she is frequently left to her own resources in the public health field. As a visiting nurse, especially in outlying sparsely populated sections of states like your own, the nurse will learn that people die because they have never seen a doctor and they have never seen a doctor because neither they nor anyone else ever found out that they were sick enough to have a doctor.

There are programs under way in your state, among others, which will station graduate nurses in these sections to become acquainted with the territory and the people and secure medical attention for them as it is needed.

The advancement of standards of medical care and the greater health consciousness of our people, has made greater and greater demands upon the nursing profession, and there is today a scarcity of qualified nurses. To meet this scarcity, further division of labor is being resorted to so that we now have an influx of so-called practical nurses and nurses aides who are expected to do the presumably less important or menial work around hospitals and elsewhere, and who need not meet very high educational standards. As one who has had fairly recent experience as a



patient, may I venture the opinion that the profession of nursing might well take heed that there is also menial work in the practice of medicine and dentistry and pharmacy, and in the research laboratories, which practitioners there must do day in and day out in order to supply a complete service to the patient. Specialization can be carried to such extremes that the identity of a general profession, such as nursing, may be lost if too much of its service is relegated to sub-professional personnel.

We need instructors and supervisors and office and industrial nurses, but we need most of all the general duty nurse whose chief and abiding interest is in the patient:

Belated recognition of the importance of dental health to the general well being of our people has focused attention upon the rapid strides which dentistry has made in recent years in the prevention of disease and in restoring tooth function. The recent establishment of a Federal Dental Research program at the National Institute of Health, will greatly augment our knowledge of diseases of the mouth and teeth.

Today the dentist's professional contribution to health is universally recognized; and, as the dentist's interest shifts from the curative aspects of dentistry to early care and prevention, the bond between dentistry and public health grows stronger.

The influence of dental research upon child nutrition programs and upon medicine in general has been profound. Public understanding of the relation of good dental health to good bodily health is being fostered admirably by the profession and the graduate in dentistry today meets a public which is no longer fearful of his technique, but glad to be able to get an appointment not too many weeks away.

The laboratory and x-ray technologist and the biological scientist, working as he does with the physician, the dentist, and the research pharmacist, makes his contribution quietly,

and without ostentation, to the general health and welfare of mankind. In addition to routine testing and general laboratory procedures which aid diagnosis, he has been and may at any time become the discoverer of the cause or cure of any dysfunction.

Who would have thought a few years ago that moulds and bacteria found in the soil or in the air could produce antibiotic agents such as penicillin, streptomycin, bacitracin, and aureomycin, which have revolutionized the treatment of infectious diseases. Yet it was the painstaking observation and recording of things seen under the microscope or in the course of laboratory procedure that led to the discovery of these therapeutic agents.

The teamwork of the biological scientists who furnish the microscope and test tube evidence of desirable reactions, coupled with the production technique of the manufacturing pharmacist and pharmaceutical engineer, and the careful supervision of the control chemist, plus the pharmacological tests and subsequent clinical trial by the physician and dentist, with the aid of the nurse, are the factors involved in the birth of new drugs. Without this teamwork medical science could not possibly make the rapid strides which it is making today.

Because the physician's professional heritage is oldest, his responsibility for leadership in advancing the cause of health is perhaps even greater than that of his colleagues in the related fields. The inter-professional approach, which considers the patient as a whole and calls upon the various specialities to serve him, must start with the physician. He is the quarterback of the medical team. He calls the signals. The law recognizes him as competent to diagnose disease and prescribe the treatment. His education has been broad enough to appreciate the value of the contributions made by other members of the team.

He may chose to devote his life to the practice of a speciality, or he may go into public health, research, or ad-

ministration. He may become an institutional doctor, or enter the field of industrial medicine, or military medicine. We hope that not too many will by-pass the field of general practice. Our rural districts are tragically short of medical practitioners. It is recognized that the general practitioner's lot is never easy, but it has its compensations in the inner satisfaction that comes from dedicated service.

A profession is a ministry which requires dedication of the services and even the lives of its members to the benefit of humanity. Those who do not have something of this spirit of dedication within their make-up should really not attempt to practice medicine or nursing or dentistry, or pharmacy, and the allied public health professions.

The family doctor so revered and immortalized in our literature is greatly in demand today and much is being done to improve his lot. It is important that some of our best young physicians become interested in general practice, for people recognize today that it takes unusual knowledge and training to deal with the patient's total problem. Truly, preventive medicine is as important as curative medicine today, and it takes a well trained practitioner to treat both common illnesses and the results of emotional stresses. It is the general practitioner who must be relied upon to indicate when the services of specialists, public health personnel, community agencies, or institutions are required. He is, therefore, the key figure among medical personnel.

Plans are under way in rural communities and small towns to provide offices in hospitals, laboratory services and other modern facilities for physicians. Opportunities for research, refresher courses and contact with experienced consultants are likewise in contemplation.

The professions and rural people are joining forces to work out the problem of adequate income for physicians and dentists who choose to practice in rural areas. In some parts of the country coordinated plans of this kind are in

operation, and it will be your privilege and opportunity to help create the patterns in which future plans for health and medical services are moulded.

I am indebted to Surgeon-General Scheele of the U. S. Public Health Service for the following comment. He says that professional graduates of 1948 can expect increased emphasis upon the health of middle aged and older persons. By the time the majority of you reach 45 yourselves, nearly one-third of the population will be that age or older. One in ten individuals will be past 65. People in these age groups will make up a much larger proportion of your patients—for chronic degenerative diseases and mental disorders increase with increased age. And thanks to men and women who have entered the health professions before you, most of the communicable diseases have been brought under control. At least, fairly simple methods of prevention or cure are available.

Your first concern will be to keep your patients in health—physical, mental, and dental health. Your major problems, therefore, will be the detection and appropriate management of chronic degenerative diseases, psychosomatic disorders, and mental diseases. These diseases occur in all age groups, and as we reduce further the communicable diseases year by year, it becomes obvious that practitioners of the future must become more and more skilled in the recognition and treatment of the non-communicable ailments of mankind.

Although medical science has advanced to the point of being able to prevent or arrest the development of many degenerative diseases, comparatively few cases are diagnosed in time to benefit from this knowledge. One of the foremost problems which confront medical research today is that of more effective case-finding technique in cancer, cardiovascular diseases and many other baffling illness. I have referred to the use of pharmacists as case finders.

In the practice of obstetrics, pediatrics, and dentistry, the professions and the majority of their patients, have

learned the value of careful, periodic examination. If existing knowledge of the diseases of middle life and late life is to be more widely applied, more reliance must be placed upon the periodic examination of adult patients. At the present time, systematic observation is the only method that will assure early detection of chronic conditions associated with aging.

As we intensify our efforts to lift the burden of chronic disease we shall progress more rapidly toward an understanding of the healthy adult. Our aim should be more than freedom from disease; it should be positive health.

As physicians, dentists, pharmacists, nurses and biological scientists working in the field of medical care you will deal with people rather than objects that produce facts for scientific analysis. You must develop an awareness of human needs as they are reflected by individuals and by groups within society. For this you have been trained, at least to some extent, in the pre-professional or so-called cultural background studies of the courses you have taken. As you proceed in your professional career you may look back upon the time when your contact with the social sciences seemed somewhat unnecessary and you may regret that you did not give them greater attention, but I am sure that by this time you are fully convinced that success in any profession can be achieved only through constant study. The end of formal education is but the "commencement" of education for life and for living. From now on you should move from one experience to another with a continual increase in your capacity for meeting professional responsibility. Internships and practical experience standards set up by the State on the advice of the professions as requirements for licensure contemplate easing you into assuming this responsibility by giving you a period in which to lean on those who act as your preceptors. You will never regret acquiring as much of this experience as possible under competent supervision before launching on an independent career.



Thanks to your cultural and professional education you will bring to the solution of the problems that come before you a disciplined mind. The undisciplined mind holds and acts upon opinion. The disciplined mind is open and constantly seeks the truth. The undisciplined mind acts often unintelligently upon what "they say". The disciplined mind inquires, "What are the facts?" and then acts accordingly.

As scientists and as people who hold the lives of fellowmen in your hands, I implore you to refuse to accept hearsay for fact.

In a democracy we must have free choice of leadership and freedom of expression, but disciplined minds will insist upon the selection of leaders for the professions, for the Government and for world affairs, who will not subordinate factual findings to expediency or opinion.

I have told you that a true profession is a ministry. It is not an undertaking for the profit of the individual, but a service to mankind. The date of your commencement comes at the beginning of the week in which we celebrate the birth of One who "came not to be ministered unto but to minister." Among His disciples was Luke, referred to by St. Paul as "my beloved Luke, the physician". St Luke records that "when Christ at the end of a particular day was confronted with a great mass of the sick, 'He, laying His hand on every one of them, healed them.' " It was the individual with whom He was concerned.

I have alluded to the physician as the key man on the medical team. But the efforts of the team in the successful practice of the healing arts must be directed to the needs of the central figure in every problem of medical care and that central figure is the individual patient and usually he is very much of an individual. The sooner you realize this important fact the more perfect will be your orientation in the world you are about to enter.



You cannot buy your way into the hearts of people. The old family doctor, or his counterpart in pharmacy, dentistry, nursing and allied sciences, never took a course on the bedside manner, nor did he read books on how to make friends and influence people. He lived each day the life of the Good Samaritan because it was just in him to do so.

It is in you too, because you joined the ministry of health four or more years ago and you have stuck to it. With others in your professional group, you joined a team here in the Medical Center of the University of Tennessee, and if you will continue to work as a member of the team dedicated to good medical care wherever you may go from here, the people will call you blessed.

In the words of Thomas Huxley, "May your body be the ready servant of your will, doing with ease and pleasure all the work of which it is capable. May you be the servant of a tender conscience, loving all beauty, hating all vileness, and respecting others as you do yourself."

In that spirit, members of the graduating classes, "The world awaits you".

---

The School of Pharmacy of the Alabama Institute of Technology is seeking instructors in the following fields: One instructor in theory, arithmetic, and operative pharmacy with a salary range of \$2,040—\$3,000; two, with rank of associate professor, one, in the fields of physiology, pharmacology, and public health, and one, in the field of operative pharmacy. The salary range for these positions is \$3,060—\$4,500. All are permanent positions on a 9 month basis, with 25 per cent extra if one wishes summer teaching. All carry retirement and group hospital benefits. For details write to Dean L. S. Blake, Alabama Polytechnic Institute at Auburn.

## Teaching the Chemistry of Organic Medicinal Products Didactic Instruction\*

LeROY C. KEAGLE  
Rutgers University, College of Pharmacy

A thorough understanding of the physical, chemical, and physiological properties of the organic medicinal products is fundamentally necessary in modern pharmaceutical practice. Opinions appear to differ regarding the most suitable way of teaching the chemistry of organic medicinal products, while certainly the practice varies. All possible differences in the organization of the subject material appear to exist, but seem to work satisfactorily.

This course is being given for the first time on a two-semester basis at our college, and I am not teaching the course. However, it is my intention to deal only with those aspects of the subject with which I am most familiar, and my remarks will be on the basis of a course as I would like to see it given.

The objective of this course, which is given in the fourth year, should be to integrate so far as possible all the student's chemical information and knowledge with any new material offered in this field. Up to about twenty or twenty-five years ago, the final year student could be expected to acquire a very good knowledge of the processes of manufacture, properties, methods of examination of purity, etc., of practically all the synthetic and naturally occurring drugs then in common use. This is no longer possible, and as the years pass, this ideal, if it really is one, becomes further removed from a practical proposition.

---

\*Read before the Conference of Teachers of Chemistry at the 1948 San Francisco Meeting.

The many synthetic and naturally occurring organic compounds necessitate considerable care in the arrangement of the final year course in "Pharmaceutical Chemistry," or rather, "The Chemistry of Organic Medicinal Products." It is hopeless and unnecessary to make any attempt to deal with them all, or even with a considerable majority of them. The lecturer has to consider carefully which ones should be discussed and which ones could be omitted. The well-established chemical groups such as the sulfonamides, barbiturates, organic arsenicals, sympathomimetic amines, etc., stand out because of their importance and the close chemical relationship between the members of each group. The same reasons apply with perhaps a little less logic to the antipyretics, local anesthetics and medicinally used dyestuffs. Alkaloids and glycosides also can be dealt with in considerable detail.

In addition to the subject matter to be presented, the lecturer has to consider carefully the type of classification to follow. In contrast to the other schemes, for example, a classification based on plant sources, or a classification based on therapeutic uses, the homologous series of organic compounds provides a convenient outline for organizing the subject matter according to chemical classification. Since the student will already have had courses in general inorganic chemistry, qualitative analysis, analytical chemistry, and general organic chemistry, it seems logical to begin the subject with a discussion of the hydrocarbons, review nomenclature, occurrence and important methods of preparation, physical properties, chemical properties, effects of homology, and important characteristic reactions of the paraffins, olefins, acetylenes, aromatic and polycyclic compounds. For this group, as well as those to be mentioned, the relationship of structure to physiological activity should be emphasized where possible, as well as the correlation of structure with physical and chemical properties of the important medicinal compounds, particularly those found in the U.S.P., N.F., and N.N.R., in order to stress the pharmaceutical uses and medicinal applications. In this man-

ner the students will be better prepared for retail pharmacy, pharmaceutical laboratories, for the pursuit of a graduate program leading to teaching, research, or whatever they may choose for their life's work.

Following the hydrocarbons would be the subject matter as outlined in Jenkins' and Hartung's book on, "The Chemistry of Organic Medicinal Products," the text we are using at Rutgers.

Enough chemotherapy should be included to arouse the student's imagination regarding its possibilities. The general organic chemistry course will have had included typical reactions which are utilized for the synthesis of medicinals and which have promise as regards still undiscovered compounds. Similarly, the more or less isolated compounds that are studied should be those whose preparation and properties illustrate significant reactions likely to be still further developed.

In the various pharmacology courses, the student will find the medicinals classified according to therapeutic uses, and for this reason the emphasis should be on the chemical characteristics and, where information is available, on the correlation of structure with physiological activity or medicinal uses. The pharmacological action of the medicinal products should be discussed only to the extent of clarifying the effects of a change in the structure of a molecule upon its medicinal use. If these structural relationships are properly stressed, then the competent pharmacy student will be able to recognize the possible chemical behavior of a medicinal agent when he sees its structural formula. In addition, the arrangement of the compounds according to chemical classification presents the subject matter for all practical purposes in the way in which it was taken up in the preliminary courses in organic chemistry and provides a means of stressing group reactions since the number of organic compounds existing is so large.

Most of the remaining chemicals can be regarded as purely organic from the pharmaceutical angle. Here again, judgment is required, since it is possible to give many lectures on each of the groups in an effort to place before the student the present position of our knowledge. Fats, oils, waxes, soaps, sugars, proteins, amino acids, vitamins, and substances related to these enter into every organic chemistry course. In our curriculum, in order to avoid a lot of unnecessary repetition, the enzymes, vitamins, proteins, amino acids, fats, sugars, and hormones are discussed in detail in the courses given by the department of the biological sciences. The fats, oils, soaps, waxes, and related products are discussed in detail in the pharmacy department courses. Consequently, the chemistry of these compounds is mentioned only briefly in the course in organic medicinal products.

Sufficient lecture time should also be devoted near the end of the course to the chemistry, where known, of the newly developed products that are classified as antibiotics, antimalarials, antihistamines, etc., so that the pharmacy student upon graduation will have a better understanding and appreciation of the physical, chemical, and medicinal properties of the products he dispenses.

It is my opinion that pharmacy students will be better trained in the chemistry of organic medicinal products when a well-balanced and properly correlated laboratory program is offered with the lecture course as a required subject, if it can be included in the curriculum, or as an elective for the students planning to go into the laboratories of a pharmaceutical concern or pursue a graduate program in pharmacy or pharmaceutical chemistry.

The widening of the field of organic medicinals from which the pharmacists' working materials are drawn; the increasing number, complexity and knowledge of these materials; and the need for their standardization have increased the opportunities for pharmacists. With the increased opportunities have come increased responsibilities,

and it is very essential that the present-day pharmacists have adequate training in this field if they are to meet these additional opportunities and responsibilities.

While I have attempted in this paper to outline the course as I would like to see it taught, I believe the most important point is that such a course, regardless of the outline followed or the subject matter included, should be a required subject in every pharmacy curriculum. A thorough understanding of these organic chemicals cannot be obtained unless the pharmacy students are given a course in the chemistry of organic medicinal products.

---

Reorganization of the Veterans Administration Central Office pharmacy division and appointment of Commander W. Paul Briggs, U.S.N., as pharmaceutical consultant have been announced by E. Burns Geiger, chief of V-A's pharmacy division.

Under the reorganization, V-A's pharmacy division in Washington, D. C., has been expanded by the creation of technical, training and operations sections—all designed to develop and maintain the best possible pharmaceutical services to patients in V-A hospitals, centers and regional offices.

The expansion became necessary with the recent elimination of V-A branch offices and the assumption in Central office of supervision of many field activities.

The technical section—under the direction of Wilbur C. Anderson, formerly chief pharmacist at the ex-branch office in Philadelphia, Pennsylvania—will review and make recommendations on requests for new drugs; inform V-A pharmacists throughout the country of new drug therapy and other technical developments, and maintain contact with other government agencies and with pharmaceutical manufacturers.

The training section—headed by Dr. Charles Schwartz, previously chief pharmacist at the former branch office in San Francisco, California—is charged with developing educational programs to maintain professional qualifications, skills and abilities of V-A pharmacists.

The operations section—with Vernon O. Trygstad, formerly chief pharmacist at the ex-branch office in Fort Snelling, Minnesota, as chief—will be responsible for developing procedures, techniques and standards for the purpose of insuring efficient and economical operations and management of all V-A pharmacies.



## Laboratory Instruction in the Chemistry of Organic Medicinal Products\*

OLE GISVOLD  
University of Minnesota

At the College of Pharmacy, University of Minnesota, we do not offer a laboratory course that would conform to the above title. Furthermore, I am not familiar with the exact laboratory course content of such a course as it may be given by other colleges. I, therefore, am predicating my views on a course related to that given in the "Pharmaceutical Syllabus" under the title "The Pharmacy of Medicinal Substances II."

I believe that the content of the laboratory instruction in "The Chemistry of Organic Medicinal Products" can be closely correlated with the didactic instruction to more firmly fix in the student's mind the subject matter taught in these courses.

The experimental (laboratory) work in conjunction with the didactic considerations of such a course should be of both a fundamental and practical nature. The experiments can well be diversified to include some synthesis, isolations from natural sources, stability illustrations, qualitative tests for identity and purity insofar as these tests aid in a better understanding of their chemistry, general solubility properties, and chemical and physical incompatibilities.

The very large number of organic compounds that are used as medicinal agents precludes any attempt at complete coverage according to the above outline. Therefore, the selection of laboratory experiments should be carefully planned to be of maximum value to the student, particularly the

\*Read before the Conference of Teachers of Chemistry at the 1948 San Francisco Meeting.

student who plans to practice retail pharmacy. In this report, I make no claim as to the superiority of the experiments selected. Because so many compounds are met with, I have listed a number of experiments in order to illustrate by the experiments the points previously mentioned. Others may not agree at all with my way of thinking. I am sure that such a laboratory outline should require the cooperation, thoughts and suggestions of other experienced teachers in the field.

As laboratory exercises in some elementary organic courses, many compounds are synthesized that are used as medicinal agents. The following compounds, which comprise part of the laboratory exercises of a course in elementary organic chemistry, are synthesized:

- |  |                    |
|--|--------------------|
| 1. Ethylene and ethylene bromide                         | 12. Citric acid    |
| 2. Preparation of ethyl alcohol by fermentation of sugar | 13. Tartaric acid  |
| 3. Diethyl ether   | 14. Aniline        |
| 4. Ethyl bromide   | 15. Acetanilide    |
| 5. Chloroform  | 16. Chloramine T.  |
| 6. Iodoform  | 17. Phenol         |
| 7. Formaldehyde  | 18. Benzyl alcohol |
| 8. Acetone   | 19. Benzoic acid   |
| 9. Formic acid   | 20. Fluorescein    |
| 10. Acetic acid  | 21. Salicylic acid |
| 11. Ethyl acetate  | 22. Aspirin        |
|  | 23. Cinnamic acid  |
|  | 24. Sulfanilamide  |

In some laboratory manuals, a number of physical and chemical properties of these compounds are considered, and, therefore, these should not have to be repeated in the laboratory course under discussion.

Although other laboratory experiments such as saponification of fats, qualitative tests for proteins and carbohydrates, etc., are given in some elementary organic laboratory courses, I believe these might best be reserved for the laboratory experiments in biochemistry. This would then permit the preparation of additional organic compounds that are used as medicinal agents.

Solubility properties in the following experiments or tests are used to illustrate or confirm generalizations and exceptions to these generalizations. They are also used to stress the differences in solubilities in a series of drugs, alkaloids, sulfonamides, etc. Furthermore, where a drug must be soluble in both water and fat solvents in order to be a useful medicinal agent, solubility tests become instructive. Therefore, fine shades of solubility properties become important.

In the following outline of laboratory experiments, type reactions have been selected to cover as many generalizations as possible. I am not going into much detail, if any, to explain why each experiment was chosen. The selections should become apparent to one who is experienced in this field of teaching.

1. **Saturated Hydrocarbons**

Test the solubility of mineral oil and petroleum ether in water, ether, alcohol, hydrochloric acid and sodium hydroxide, concentrated sulfuric acid and vegetable oils.

2. **Aliphatic Halogenated Compounds**

Test the solubility of chloroform and tetrachlorethylene in water, ether, alcohol, sodium hydroxide, concentrated sulfuric acid and vegetable oils.

Test chloroform and tetrachlorethylene for phosgene formation.

Test the stability of iodoform to illustrate release of iodine.

3. **Aliphatic Hydroxy-containing Compounds**

Test the solubility of alcohol, isopropyl alcohol, amylene hydrate and amyl alcohol in water.

Synthesize terpin hydrate.

Test the solubility of benzyl alcohol in water, alcohol, and fixed oils.

Prepare eutectic mixtures of menthol with camphor, thymol, phenol and Chloral hydrate.

Test the solubility of tribromethanol in water and amylene hydrate.

Test the stability of tribromethanol solution in alcohol and water, i. e. let the solution stand in a clear glass bottle until the solution becomes acid to litmus.

Synthesize chlorobutanol from acetone to  $\text{CHCl}_3$  and dry KOH.

Test the solubility of propylene glycol and glycerin in fixed oils, alcohol and water.

**4. Aliphatic Ethers**

Perform the following:

1. Solubility tests.
2. Peroxide formation.
3. Tests for peroxides.
4. Methods for removal of peroxides.
5. Stabilization of ethers against peroxide formation.

**5. Aliphatic and Alicyclic Aldehydes and Ketones**

Perform the following:

1. Coagulation test of formaldehyde solution and albumen.
2. Eutectic mixtures of chloral hydrate.
3. Decomposition of chloral hydrate in alkalies.
4. Chloral plus a dilute solution of alcohol, allow to stand to observe separation of the addition product.
5. Remove the antioxidants from benzaldehyde and allow the benzaldehyde to stand. Subsequently check for benzoic acid.
6. Eutectic mixtures of camphor.
7. Allow a mixture of iodine and acetone or camphor to stand in order to observe the slow disappearance of the halogen.

**6. Aliphatic Carboxylic Acids and Derivatives**

1. Test the solubility of acetic acid, lactic acid and stearic acid in water, alcohol and ether.
2. Test the solubility of sodium acetate and sodium stearate in water, alcohol and ether.
3. Note the odor of acetic, propionic valeric, palmitic, oleic and stearic acids.
4. Determine the pH of an aqueous solution of acetic and trichloroacetic acids. Also determine the pH of their sodium salts.
5. To solutions of sodium stearate or sodium oleate add a mineral acid, a solution of calcium hydroxide and lead acetate.
6. Prepare steardine or some related compound.
7. Prepare iodized oil U. S. P.
8. Test the solubilities of fats and oils in water, alcohol and ether.
9. Allow a sample of cod liver oil or cottonseed oil to be well exposed to the air for some time. Test for peroxides and rancidity.
10. Prepare amyl nitrate.
11. Allow a solution of amyl nitrate to stand for some time exposed to light and air and then test for decomposition products.

**7. Aliphatic Nitrogen Containing Compounds**

1. Test the pH of aqueous solutions of various amines such as mono, di and triethanol amines, ethylene diamine, etc.
2. Test the pH of ethyl carbamate in aqueous solution.
3. Test the pH of urea in aqueous solution.
4. Test chloroazodin and succinchlorimide for active chlorine.
5. Synthesize ethyl carbamate.

**8. Phenols and Their Derivatives**

Perform the following:

1. Solubility tests (representative examples)

Water

Phenol, cresol, eugenol, thymol, chlorothymol, betanaphthol, resorcinol, pyrogallol, pyrogallol triacetate.

2. Eutectic mixtures with phenols.
3. Precipitation tests with albumen, other proteins, and basic substances, i. e. alkaloids, picric acid, pyrogallol, tannic acid.
4. Reactions of phenols with halogens.
5. Stability tests.
  1. Storage in solution under varying conditions of light.
  2. Storage in the presence of variable pH conditions.
6. Synthesis and Preparation.

Thymol Iodide  
Eugenol from Oil of Cloves

Tannins

1. Distinguish by chemical tests between a hydrolyzable tannin (gallotannin) and phlobatannins (non hydrolyzable).
2. Perform tests of solutions of tannins and alkaloids to demonstrate that some alkaloids are precipitated by tannins whereas some are not.
3. Perform precipitation tests with gelatin and egg albumin.
4. Perform the ferric chloride color tests on gallotannin and phlobatannins.

**9. Aromatic Alcohols, Aldehydes, Ketones and Quinones**

1. Synthesize benzyl alcohol from benzaldehyde by Cannizzaro's reaction.
2. Test the solubility of benzyl alcohol in water, alcohol, fats and oils.
3. Synthesize cinnamaldehyde.
4. Prepare freshly distilled benzaldehyde. Allow a portion of this freshly distilled material to stand exposed to light and air for some time.

Test for benzoic acid. Add an antioxidant to a second portion and treat as described above.

5. Subject vanillin to the same stability tests using alcoholic solutions of vanillin.

#### 10. **Aromatic Acids and their Salts and Esters**

1. Recover the benzoic acid from the Cannizzaro's reaction used to prepare benzyl alcohol.
2. Prepare benzoic acid by the air oxidation of benzaldehyde.
3. Observe the stability upon standing of a solution of sodium salicylate and a solution of sodium salicylate containing sodium bicarbonate.
4. Synthesize mandelic acid and prepare calcium mandelate.
5. Test the solubility of benzoic and salicylic acids in water, alcohol and ether.
6. Prepare methyl salicylate or benzyl benzoate.
7. Test the solubility of the above compounds in water, alcohol and fixed oils and ether.
8. Synthesize ethyl or butyl aminobenzoate.
9. Prepare butesin picrate.
10. Test the incompatibility of procaine hydrochloride toward sodium bicarbonate and sodium carbonate.
11. Test the pH of free procaine and procaine hydrochloride.
12. Hydrolyze phenyl salicylate and test for phenol and salicylic acid.

#### 11. **Aromatic and Aromatic Aliphatic Nitrogen Containing Compounds**

1. Perform stability studies in the series of pressor drugs under variable pH values.
2. Duplicate the above studies using stabilizing agents such as bisulfites, etc.
3. Duplicate the above studies using free sulfa drugs and their sodium salts.
4. Prepare and observe the stability of a carbonate of a pressor drug, i. e. benzedrine.
5. Determine the pH of some free pressor drugs and their salts.
6. Test eutectic mixture formation of acetanilid or acetophenetidin with salol, etc.
7. Synthesize salicyl amide.

#### 12. **Sulfur Compounds**

1. Note the odor of B.A.L. as characteristic of sulphydryl compounds.
2. Test the solubilizing effect of B.A.L. upon protein bound arsenicals.



3. Test chloramine-T for active chlorine.
4. Test the solubility of chloramine-T and dichloramine in water and chlorinated paraffin.
5. Solubilities of sulfonamides.  
To impress upon the student the differences in solubilities in the various sulfa drugs.
6. Perform pH measurements of the various sulfa drugs.
7. Test the solubilities of the sodium salts of the sulfa drugs.
8. Perform the following type reactions of the sulfa sodium compounds with:
  - a) Carbon Dioxide
  - b) Ammonium bromide
  - c) Salts of nitrogenous bases
    1. Ephedrine hydrochloride, etc.
9. Perform pH measurements of the various sulfa sodium compounds.
10. Synthesize the following:
  - a) Sulfaguanidine
  - b) Sulfamerazine
11. Test the solubility of saccharin in water and in alkali.
12. Test the pH of an aqueous solution of saccharin.
13. Bubble a stream of carbon dioxide through a solution of soluble saccharin and observe the results.

### 13. Compounds Containing Heavy Metals

#### A. Silver

- 1) Prepare a silver protienate (such as silver caseinate).
- 2) Test for ionizable silver in mild and strong silver protein preparations.
- 3) Observe the stability upon prolonged standing of aqueous solutions of the various silver protienates.

#### B. Mercurials

- 1) Synthesize a mercurial used as an antiseptic.
- 2) Phenyl mercuric chloride.
  - a) Solubility in water
  - b) Incompatibilities
    1. Iodine
    2. Potassium Iodide
- 3) Phenyl mercuric nitrate
  - a) Solubility in water
  - b) Incompatibilities
    1. Iodine
    2. Soluble halides, i. e. potassium iodide, sodium chloride, etc.
4. Nitromersal (Metaphen)
  - a) Solubility in water

- b) Solubility in alkali
- c) Incompatabilities
  - 1. Iodine
- 5) Merthiolate
 

Incompatability with carbonic acid, acids, salts of nitrogenous bases, etc.
- 6) Mercuric salicylate
  - a) Solubility in water
  - b) Solubility in sodium chloride and sodium carbonate
- 7) Mercuric succinimide
  - a) Incompatabilities and reactions
    - 1. Acids
    - 2. Alkalies
    - 3. Hydrogen sulfide
  - b) Stability
    - 1. Exposure to light for a prolonged time.

C. Arsenicals

Sodium salts of the arsenicals are incompatable with strong acids and salts of nitrogenous bases such as alkaloids, local anaesthetics, etc.

Test the compatability of the sodium salts of the arsenicals with strong acids and salts of nitrogenous bases such as alkaloids, local anaesthetics, etc.

14. **Heterocycles of Five and Six Membered Rings**

1. Test the precipitation of antipyrine from aqueous solution with tannins (gallo tannin and phlobatannins).
2. Test aqueous solutions of antipyrine with ferric chloride to show colored complex formation together with oxidation.
3. Test the solubility of barbiturates in water, alcohol and ether.
4. Test the pH of aqueous solutions of barbiturates.
5. Prepare an aqueous solution of a sodium salt of a barbituate.
6. Test the pH of the above solution.
7. Pass carbon dioxide into the above aqueous solution.
8. Add ammonium bromide or the salt of a nitrogen containing compound to the above aqueous solution.

15. **Dyes**

General Properties:

- 1) Dying properties for cotton and wool.
- 2) Solubility properties.
  - a) Water
  - b) Oils. i. e. olive or cottonseed

**A. The acridine Dyes**

1. Perform pH measurements of the variously monoamino substituted acridines.
2. Perform pH measurements of Acriflavine Hydrochloride and Acriflavine.
3. Incompatibility of Acriflavine Hydrochloride with the sulfa sodium compounds; basic nitrogen compounds, etc.
4. Dying effects with serum proteins.
5. Stability of solutions upon standing. Compare clear glass with light resistant containers.

**B. The Triphenylmethane Dyes**

1. Incompatibilities when mixed with other dyes.
2. Reduce methylrosaniline chloride on a qualitative test scale. Leuco dye inactive bacteriostatically.
3. Prepare a triphenylmethane dye.

**C. The Phenolphthalein Dyes**

1. Test the solubility of these dyes in water.
2. Test the solubility of the phthalein sodium compounds.
3. Perform pH measurements of the aqueous solutions of the phthalein sodium compounds.
4. Type reactions of the phthalein sodium compounds with:
  - a) Carbon dioxide, HCl, etc.
  - b) Salts of nitrogenous bases.

**D. Azo Dyes**

Chloroazodin

Test for active chlorine.

**E. Miscellaneous Dyes**

Methylene Blue

- 1) Reduction with zinc dust and acid followed by re-oxidation.

**16. Surface Active Agents**

1. Prepare on a test scale a sulfonated oil, i. e. olive or castor oil plus concentrated sulfuric acid and neutralized the mixture.
2. Prepare sodium cetyl sulfate on a test scale and examine for detergent properties.
3. Add acid to a solution of sodium oleate and explain.
4. Add acid to a solution of sodium laural sulfate and explain.
5. Add lime water to a solution of sodium oleate and explain.
6. Add lime water to a solution of sodium laural sulfate and explain.
7. Examine several types of surface active agents for their detergent and surface active properties.

8. Test the pH of aqueous solutions of the various surface active agents.

**17. Glycosides**

1. Perform some water and alcohol solubility tests on a variety of glycosides such as salicin, rutin, digitoxin, etc.
2. Taste the aqueous and alcoholic solutions of the above glycosides.
3. Test the reducing properties (Fehling's solution) of a glycoside before and after hydrolysis (by acid or enzymatic methods). If amygdalin is used, note the odor of benzaldehyde before and after hydrolysis.
4. Perform the U.S.P. color test for digitoxin and digoxin.
5. Extract the crude glycosides from *digitalis purpurea* and perform the U.S.P. color test.

**18. Steroids**

1. Test the solubility of cholesterol in water, alcohol and fixed oils.
2. Demonstrate the surface active properties of bile salts.
3. Acidulate aqueous solution of bile salts.
4. Hydrolyze a solution of the sulfate conjugates of estrone.
5. Recover the estrone and determine its solubility in alkali.
6. Test the reducing action of desoxy corticosterone and other corticometric substances.

**19. Alkaloids**

1. Test the water solubilities of a number of alkaloidal salts in order to demonstrate the widely diversified solubilities met with in these compounds.
2. Demonstrate the incompatibilities of alkaloidal salts with sodium bicarbonate and other basic substances.
3. Determine the pH of a number of alkaloidal salts including quinine hydrochloride and quinine dihydrochloride.
4. Demonstrate the incompatibility of certain salts of alkaloids with soluble silver salts.
5. Bubble a stream of carbon dioxide through a solution of sodium theophylline or allow a solution of sodium theophylline to stand for some time to observe the action of carbon dioxide.
6. Test the pH of a solution of sodium theophylline.
7. Test the stability of physostigmine and (or) apomorphine at various pH.
8. Prepare and crystallize an alkaloidal salt.
9. Test the solubility of certain alkaloids, ephedrine, atropine, etc. in liquid petrolatum.

20. Vitamins

A. Vitamin A

- 1) Examine and describe pure crystalline vitamin A.
- 2) Perform the antimony trichloride test on the non-saponifiable portion of a sample of cod liver, halibut liver or shark liver oil.

B. Vitamin D

C. Vitamin E

Perform the iron-pyridyl test on the non-saponifiable portion of wheat germ oil.

D. Vitamin K

- 1) Prepare 2-methyl-1,4-naphtho quinone by the oxidation of 2-methyl naphthalene.
- 2) Reduce menadione with sodium hydrosulfite.
- 3) Prepare menadione sodium bisulfite.

E. Thiamin Hydrochloride

- 1) Perform the thiochrome test for thiamin hydrochloride.
- 2) Treat thiamin hydrochloride as follows:
  - a) Heat aqueous solution
  - b) Add alkali to an aqueous solution
  - c) Add sodium bisulfite to an aqueous solutionAfter each of the above tests perform the thiochrome test.
- 3) Test the pH of a solution of thiamin.

F. Riboflavin

- 1) Test the solubility of riboflavin water.
- 2) Test the stability of riboflavin to light via lumichrome and lumiflavin formation.
- 3) Repeat the above test in the presence of alkali.
- 4) Repeat the above test upon solutions buffered on the acid side.
- 5) Test the pH of a solution of riboflavin.

G. Nicotinic Acid

- 1) Prepare nicotinic acid by the oxidation of nicotine.
- 2) Test the pH of a solution of nicotinic acid.

H. Nicotinic Acid Amide

- 1) Test the pH of a solution of nicotinic acid amide.

I. Pyridoxine, pyridoxal, pyridox amine

- 1) Test the light sensitivity of these three compounds at a pH of 7 or higher.
- 2) Repeat these tests at lower pH values.

**J. Ascorbic Acid**

- 1) Test the pH of an aqueous solution of ascorbic acid.
- 2) Test the acidity of an aqueous solution of ascorbic acid by the addition of sodium bicarbonate.
- 3) Decolorize a solution of iodine and (or) a solution of 2,6-dichloroindophenol.
- 4) Allow a solution of ascorbic acid to stand in the presence of sodium bicarbonate for a given period of time and then apply the tests described in the above question.

**K. Folic Acid**

- 1) Test the solubility of folic acid in water and in alcohol.
- 2) Observe the stability of dilute solutions of folic acid to sunlight and to pH levels lower than 6.

---

At its February meeting the American Council on Pharmaceutical Education made important changes in its accreditation standards and inspection procedures and techniques. In general, the changes are in conformity with the recommendations of The Pharmaceutical Survey, and are intended, in part, to serve the aims, purposes and objectives of that undertaking.

Of major interest is the decision of the Council to classify colleges of pharmacy as A, B, C or Y, depending entirely upon their degree of compliance with Council Standards, as follows:

Class A—Those colleges which have no important deficiencies.

Class B—Those colleges which have deficiencies that can be corrected promptly by administrative action.

Class C—Those colleges having deficiencies which will take considerable time and effort to correct. A college in this class will be given a period to be determined by the Council in which to correct its deficiencies or show cause why it should not be dropped from the accredited list but in no case shall this period exceed three years.

Class Y—Newly established colleges which have at least two years of their four-year curricula accredited. Accreditation in these instances will be temporary and a college thus accredited will be designated as a Y2 or Y4 to indicate the number of years of the curriculum which has been accredited.

A class Y college which does not apply for full accreditation or one which applies for full accreditation but does not meet all the requirements for ac-



## A Discussion of "Laboratory Instruction in the Chemistry of Organic Medicinal Products"\*

HAAKON BANG

The State College of Washington

The State College of Washington, School of Pharmacy does not offer a course which follows the one which has been discussed. Therefore, this author was in somewhat of a quandary as to how Professor Gisvold would attack the subject. This paper just given naturally influenced his thinking.

There are a few generalizations that should be made before discussing the paper. An important consideration is to check particularly the technic used in the laboratory. In the author's experience, the student's trained in the fundamentals of chemistry, both organic and inorganic, in the departments of chemistry, develop habits which are not desirable in the conduct of a pharmacy.

Students are not always taught to keep their desks orderly, or to make neat set ups. For this reason, orderliness, neatness and dispatch, are factors which are extremely important in the practice of pharmacy regardless of the field.

Accuracy and exactness are other virtues too easily lost in practice and if not acquired in college—not only in compounding courses but also in courses in chemistry—practitioners will be produced who have very slovenly habits.

Professor Gisvold's selection of laboratory exercises is good. This author feels that the emphasis might be shifted

---

\*Read before the Conference of Teachers of Chemistry at the 1948 San Francisco Meeting.

somewhat so as to stress the chemico-physical properties of some of the functional groups which have already been studied in organic chemistry, and apply these principles to pharmaceutical practices. This laboratory course could deal with the chemico-physical properties of saturated aliphatic compounds, unsaturated aliphatic compounds, alkaloids, gly-compounds, unsaturated aliphatic compounds, aromatic compounds, alkaloids, glycosides, vitamins and hormones.

Although the synthesis of several compounds can be carried out, it might be well for different students to make different medicinal products so a variety of experiences may be gained.

Rules for the prediction of solubilities might be studied and tested in the laboratory so that a student will be better able to find suitable solvents in his prescription practice.

The chemical properties should include a study of the general stability of the chemical groups and methods of stabilization. General characteristic reactions should be reviewed with an accentuation on incompatibility and means by which these incompatibilities may be overcome. These general reactions can well be used in the dispensing courses which are to follow.

Although tests for specific organic medicinals could be included, this author believes that time would not permit too much emphasis on this phase. Some tests could be carried out merely to call the student's attention to the tests which are found in the U.S.P. and N.F. Time permitting, one experiment on the identification of one organic compound, using the methods of Kamm, Shriner and Fuson or McElvain may be in order, but the author again feels that this process should be left to a course in qualitative organic analysis if such is included in the curriculum. This experiment would be of value to familiarize the student with this procedure, if he does not deal with it in some other course.

It appears that the greatest problem confronting us is not one of finding material, but in selecting that material which would be the most useful to the average student who will probably go into the average drug or exclusive prescription store. Realizing that a greater percentage of students will go into the former mentioned fields, the laboratory course should be geared more to their needs.

With these general considerations in mind, the following is another suggested outline for a course under consideration:

- I. Saturated Aliphatic Compounds: (Mineral oil)  
Physical properties: viscosity, solubility in common solvents.  
Chemical reactions: Stability to acids, bases, halogens, and other common agents.
- II. Unsaturated Aliphatic Compounds: (Ethylene)  
Physical properties: Solubility studies in inert and reaction solvents.  
Chemical reactions: Reactions to halogens, bases, acids and other reagents.
- III. Aromatic Compounds: (Benzene)  
Physical properties: Solubility studies  
Chemical reactions: Reactions with halogens, acids, bases and other reagents.
- IV. Acids: (Tartaric, benzoic acids)  
Physical properties: Solubility studies such as in acid and bases, organic and inorganic solvents.
- V. Alcohols: (Ethyl, methyl, isopropyl alcohols)  
Physical properties: Study of miscibilities and boiling points.  
Chemical reactions: Reactions with sodium, acids, acids with dehydrating agents.
- VI. Aldehydes and Ketones: (Formaldehyde, benzaldehyde, acetone)  
Physical properties: Studies of solubility and miscibility.  
Chemical reactions: Reactions to acids and bases, amino compounds, oxidizing agents and other tests.

VII. Amines and Amino Compounds: (Aniline)

Physical properties: Solubilities in acids, bases, and immiscible solvents.

Chemical reactions: With nitrites, aldehydes, and other reagents.

VIII. Nitro Compounds: (Nitrobenzene)

Physical properties: Solubility studies.

Chemical reactions: Reactions with reducing substances.

IX. Alkaloids:

Separation of alkaloids from some alkaloidal bearing crude drug.

Physical properties: Solubilities of alkaloidal bases and salts in water and immiscible solvents.

X. Glycosides:

Separation of a glycoside from some glycosidal bearing crude drug.

Chemical reactions: Hydrolysis of some glycosides and a test for the products yielded.

XI. Vitamins and Hormones:

Some experiments to show their stability and properties.

XII. Application of some U.S.P. and N.F. tests on some products to acquaint the student with these tests. Some examples which may be used would be acetyl salicylic acid, benzoic acid, acetanilid, methenamine, strychnine and other official substances.

XIII. The synthesis of some organic medicinal. Each student working on a different synthesis. The students should be urged to become acquainted with what other students are doing, and to criticize the set ups and technics of those other students as well as their own technic.

XIV. The identification of some organic substance used in medicine. This experiment, if included, would be designed to familiarize the student with the methods used in identifying organic compounds. The author feels that this part could well be omitted and only included for the better students who wish extra credit.

The criticism of this outline may be that it too closely follows or overlaps courses given in chemistry. This criticism is valid if the stress is not placed in the right places. Another criticism might be that it overlaps some of the simple principles used in compounding and incompatibilities. This would also be true if the stress were not rightfully placed.

This course should be an intermediate course between organic chemistry and the compounding courses, a stepping stone from the fundamentals taught in organic chemistry to the course in compounding.

---

(Continued from Page 324)

creditation as a Class A college within one year after the full four years of its curriculum are in operation, will be required to show cause why it should not be dropped from the accredited list.

Any reference to accreditation by the Council in bulletins or other publicity issued by a college of pharmacy shall indicate its classification and be stated as follows: "(name of institution) is accredited by the American Council on Pharmaceutical Education as a Class (A, B, C or Y) college."

There are many reasons for these classifications. In the first place, prospective students are entitled to know the relative standing of the schools of pharmacy, and particularly that of the college which he contemplates attending.

It was felt also that classifying colleges as A, B or C would stimulate the "A" institution to maintain and sustain their present high standing.

Such listings, too, would be conducive to more rapid improvement and betterment upon those institutions whose present status does not justify "A" rating.

Classifications of this kind have been helpful in raising educational standards in other professional fields, and there is every reason to believe that they will have a salutary effect upon colleges of pharmacy.

The accreditation standards and inspection techniques as now worked out will seek more complete and more illuminating information with respect to faculty personnel, teaching facilities, class-

(Continued on Page 332)

## The Scope and Content of an Undergraduate Course or Courses in Organic Pharmaceutical Chemistry\*

HENRY S. JOHNSON

University of Connecticut College of Pharmacy

Five years ago, at the Conference of Teachers of Chemistry, in Columbus, Ohio, I read a paper<sup>1</sup> in which I attempted to evaluate and comment on that part of the Pharmaceutical Syllabus which dealt with organic chemistry. My assignment this year covers much the same ground. As given by your secretary, it is to discuss "The scope and content of an undergraduate course or courses in organic pharmaceutical chemistry—to deal with the objectives, titles, hours and credits, division of class hours and laboratory hours, place in the curriculum, scope, and subject matter content of such a course or courses."

The use of the expression "course or courses" is an indication of some difference of opinion as to whether *all* the material offered as organic pharmaceutical chemistry should be included in a *single* course; or whether it should be divided into *two* courses, one of which would present the general principles, while the other would deal primarily with the application of these principles to many of the compounds used in pharmacy and medicine.

My experience of the past five years has served to strengthen most of the opinions I expressed in 1943, and I still believe it is preferable to give the pharmacy student an elementary course in the fundamentals of organic chemistry first of all, and to follow it later on with a course in which more extensive application of the principles is made to medicinal products.

\*Read before the Conference of Teachers of Chemistry at the 1948 San Francisco Meeting.

<sup>1</sup>*Am. Journal of Pharmaceutical Education*, Vol. 8, p. 49 (Jan. 1944)



Since the other papers on our program today seem to deal primarily with this latter course, I shall devote most of my time to a discussion of the elementary course. Insofar as the title goes, I believe that this first course should simply be called "Organic Chemistry." It should be the equivalent of the two-semester course in organic chemistry commonly offered in arts and science curricula. The content should follow that of the standard texts commonly used for such courses. I do not believe that any more extensive statement as to content is needed. It is true that no two teachers will give identical material, but much of the same material will be covered in *every* school, although some instructors will wish to lay greater stress on one thing; some on another. This is as it should be, for every course reflects the personality and training of the instructor. However, all good teachers will give a sound foundation of general basic principles, and that is the important thing.

Now, let us examine the *reasons* for including a course in organic chemistry in the pharmacy curriculum, as set down by Dr. Blauch's Committee on Curriculum Studies of The Pharmaceutical Survey. The following is a quotation from the tentative statement of that group regarding organic chemistry:

"There are at least three reasons why instruction in organic chemistry must be included in the pharmaceutical curriculum. First, knowledge of its principles and facts is essential to understanding the chemical nature, composition, and properties of approximately 80 percent of the chemical entities listed in the U.S.P., N.F., and N.N.R. Second, constantly increasing numbers of drugs are being synthesized, and pure active principles continue to be isolated even from refractory natural mixtures. Third, organic chemistry is an essential prerequisite to an understanding of biological processes such as are met with in biochemistry, pharmacognosy, and pharmacology."

The *objectives* of the course in organic chemistry in the pharmaceutical curriculum are listed by The Survey Committee as follows:

"1. Acquaintance with accepted principles of nomenclature, and with the structure, occurrence, general and characteristic class reactions, properties of organic compounds, methods of synthesis, and fundamental theories of organic chemistry.

2. Acquaintance with the skills and technics of the organic laboratory, many of which are used without modification in pharmaceutical practice.

3. Acquaintance with the properties which affect the stability and compatability of organic drugs and determine the suitable conditions for their storage, preservation, and use."

The Pharmaceutical Survey Committee further goes on to define the content of the course as follows:

"The content of the didactic instruction should be comparable to that given in a course accredited by the American Chemical Society. The fundamental theories and typical classes of organic compounds should be illustrated by materials that have medicinal and pharmaceutical value. It would be strange indeed if such materials were not used, even in courses given by a liberal arts faculty. As examples, it may be observed that ethylene (U.S.P. XIII) is a typical olefin, the Kolbe reaction of which was originally discovered and is still best illustrated by the synthesis of salicylic acid (U.S.P.), and chloroform and iodoform are obtained by the haloform reaction."

I shall not attempt here to weigh the advantages of having separate instruction for pharmacy students when courses are taken in the arts and science college of the university. As stated above, even in courses given by a liberal arts faculty, the use of illustrations from pharmacy and medicine is likely to be commonly found, and this helps to motivate the course for pharmacy majors. Even if pharmacy students *are* mixed with others in lecture work, it may be possible to provide separate quiz sections for them; but most important of all, it seems to me, is that a good course in the fundamentals be offered. Better have such a course, even though given by a member of the liberal arts faculty, than a course full of applications, but taught by someone inadequately trained in the principles of organic chemistry, and therefore not given in a satisfactory manner insofar as general principles are concerned.

So as to serve its purpose most effectively, I believe that organic chemistry can best be given in the second year of the four-year pharmacy curriculum, in order to be put to use as early as possible, and to precede instruction in pharmacognosy, biochemistry, pharmacology, and pharmacy, in all of which a knowledge of the principles of organic chemistry should prove of value. And, as suggested by the Curriculum Committee of The Pharmaceutical Survey, it should deal primarily with the *fundamentals* of organic chemistry, and need include only as much so-called pharmaceutical chemistry as fits in logically and smoothly to illustrate the general classes of compounds and general reactions.

Regarding the credit and time for this course, the tentative statement of The Survey Curriculum Committee has the following to say:

"The course in organic chemistry should carry 10 semester hours of credit, which would require 96 hours of didactic instruction and 192 hours of laboratory instruction.

A reasonably satisfactory course could be given with 96 hours of didactic instruction and 96 hours of laboratory work. Such a course should carry 8 semester hours of credit."

I believe that ninety-six hours of didactic work seems adequate for this elementary course, and that at least ninety-six hours should be devoted to laboratory work. Some will feel that as many as twice that number of laboratory hours (192) are necessary to present this course satisfactorily.

Since Dr. Blauch's Committee suggests that the content of the didactic instruction for this course should be comparable to that given in a course accredited by the American Chemical Society, (and I heartily agree), it may be of value to examine the requirements set down by the Committee on Professional Training of the American Chemical Society for such a course. This is as follows:

"Organic Chemistry, comprising the equivalent of thirty weeks<sup>2</sup> of instruction, with three hours of lectures or recitations a week and five to six hours of laboratory a week. This course should preferably include some qualitative organic analysis unless a special course in this subject is offered, and must include organic preparation work."

Additional requirements of the A. C. S. Committee on Professional Training cover adequate laboratory facilities, adequate library facilities, and adequate financial support from the university for these two.

Dr. E. M. Billings, secretary of the American Chemical Society Committee on Professional Training writes that:

"In addition, the Society expects that any organic chemistry course shall be taught by one whose training was in that field, and who in all probability received his doctorate in that phase of chemistry; also that a standard, well known, up-to-date textbook shall be used to accompany the lecture work, and this holds true with reference to the laboratory manual."

As I have mentioned before, no outline, syllabus, or textbook, however good, can serve as a substitute for a well qualified, properly trained, and inspiring instructor in this or any other course. No course can be any better than the instructor who gives it.

The minimum standards for faculty members teaching chemistry courses, as proposed by the Committee on Professional Training of the American Chemical Society, cover such varied and pertinent topics as the adequate training of every member of the department, the size of the staff in relation to the diversity of courses offered, individual research productivity, teaching load, and salary range of each faculty member, avoidance of excessive inbreeding in making new appointments, active participation of each staff member in national and regional societies in his field of specialization, laboratory sections being in charge of re-

<sup>2</sup>30 weeks are interpreted as a period of a year's instruction exclusive of the examination periods at the end of each semester.

sponsible faculty members, and the maximum size of quiz sections. It is beyond the scope of this paper to discuss each of these points at length, but I believe that the requirements for staff members in charge of the fundamental chemistry courses in pharmacy colleges should not be lower than those required in the chemistry courses of liberal arts and science colleges. For those teaching more specialized courses in pharmaceutical chemistry, certain additional requirements may be necessary.

Up to now, most of my remarks have dealt with the first course in organic chemistry. A more advanced course in the chemistry of organic medicinal products, where application of the general principles previously learned is stressed, could be given in the junior or senior year of the four-year pharmacy curriculum. I do not believe it is desirable in this paper to be too specific about the exact number of hours and credits for such a course. Some schools may want to devote a considerable portion of their available time to this work, and others to give to it only the minimum amount of time. Some schools will wish to stress the didactic instruction in the chemistry of organic medicinal products, others the laboratory work. Certainly at least three semester hours credit should be a minimum for this advanced course, and the elementary organic chemistry course which I have discussed should be a prerequisite. Nor will I attempt to outline in this paper the subject matter, organization, method of presentation and so forth, of such a course, since the papers following this on today's program will deal more specifically with this matter.

To summarize, I believe that the material offered in organic pharmaceutical chemistry in the four-year pharmacy curriculum should be given in two separate courses, and that no *very extensive* application of the principles to medicinal products need be included in the course where the general principles are first learned. For the elementary course, 8-10 credits should be earned, covering approximately 3 hours of didactic work and 3-6 hours of laboratory work

for two semesters. This elementary course can best be given in the sophomore year. The scope and subject matter of this course will depend more upon the excellence of the instruction than upon any outline of topics. Although a standard textbook should be used, the calibre of the instructor is far more important than any choice of a book, since a superior instructor can present an excellent course regardless of text, and an inferior instructor will not give a satisfactory course, even with the best text available. Under these circumstances, I do not believe it necessary to provide any extensive outline of subject matter for this course. In most respects, such a course should fulfill the minimum standards proposed by the Committee of the American Chemical Society in evaluating undergraduate professional training in chemistry.

---

(Continued from Page 325)

room and laboratory space, library, administration, budgetary control, and other pertinent facts bearing upon the adequacy of the colleges of pharmacy to provide satisfactory training for pharmacists.

While the accreditation standards and methods of operation have been substantially strengthened and revised, these steps have been taken by the Council in order to give it a practical approach to the facts, factors and problems involved in the evaluation of educational methods as exemplified by the curriculum and general fitness of colleges of pharmacy.

All colleges of pharmacy have been furnished with copies of the revised accreditation standards. Future inspections will be based upon the new standards.

The whole accreditation policy of the Council is based upon the intention to have "A" schools maintain their "A" rating. The Council also aims at having "B" and "C" schools become "A" schools without undue delay.

The Council visualizes only "A" colleges of pharmacy, once its accreditation program becomes in full force and effect.



## Discussion on the Scope and Content of an Undergraduate Course or Courses in Organic Pharmaceutical Chemistry\*

JOSEPH D. MATTHES  
Massachusetts College of Pharmacy

Dr. Johnson has pointed out in his paper that this subject has been discussed in the past; it will, I hope, be discussed many times in the future. Organic chemistry or organic pharmaceutical chemistry, if you will, is a growing subject with its relation to pharmacy changing daily. The requirements we suggest today may be wholly inadequate in two or three years. Now, when the entire curriculum is being checked and reviewed, is the time for us as teachers of chemistry to get together and exchange ideas.

The chief purpose of the schools and colleges of pharmacy is the training of retail pharmacists. With this in mind, we should be able to set certain minimum standards in the field of organic chemistry. It must be pointed out that these will always be minimum standards because many schools will wish to give more hours to the subject. However, with the curriculum as crowded as it is with required subjects, all too often these minimum requirements are all that can be given.

Each school or college and each instructor will have problems, individual in character, that must be solved. It would help the national picture if the title, objective, scope and subject matter content were uniform throughout the member colleges of the A.A.C.P. More and more students and teachers are transferring from one college to another. A more or less uniform curriculum would solve some of the problems encountered in these transfers.

\*Read before the Conference of Teachers of Chemistry at the 1948 San Francisco Meeting.

In this discussion may I first list the points on which I am in agreement with Dr. Johnson. First, the title of the course should be simply "Organic Chemistry." Second, it should come as early as possible in the curriculum and, from experience, the second year seems to be the logical place. Third, the objectives of the course are well stated by The Pharmaceutical Survey Committee.

It is principally in the interpretation of some of the ideas that I wish to differ with Dr. Johnson. Naturally, if a course is entitled "Organic Chemistry" at a university, it may logically be assumed that any course by this title, and having the required hours, would be acceptable to students of pharmacy. I would not agree to this, in fact I do not believe that Dr. Johnson would agree, because he has suggested that the pharmacy student be placed in a separate quiz section. The needs of the student of pharmacy are decidedly different from those of other students.

Dr. Johnson has said that most teachers of organic chemistry use as examples common pharmaceutical or medicinal compounds. Would it not be better if all of the examples used were of a pharmaceutical nature? Would it not be better to develop the entire course in organic chemistry from the point of view of pharmacy? I believe it should be done in this manner. There is at least one excellent text which does this.

I am convinced that organic chemistry can best be taught to students of pharmacy by a person who is first a pharmacist and secondly an organic chemist. Dr. Johnson has noted that the course in organic chemistry (or any course) is only as good as the person giving it. We all know this to be true. Perhaps we do not have men trained to give the course as I have suggested. Perhaps it is better for our students to hand them over to a teacher in the arts and sciences to be trained. I doubt this, however.

The number of hours assigned to organic chemistry, and the division of these hours, has for some time been set in most colleges at 96 didactic and 192 laboratory hours. Personally I agree with the total number of hours assigned to the subject but I feel that for the average student of pharmacy the course should be divided into 96 hours of lecture, 64 hours of discussion or quiz, and 128 hours of laboratory. Once more may I say that the laboratory work should be adapted to pharmaceutical needs.

May I summarize my ideas on the course in organic chemistry:

A single course, "Organic Chemistry", of 288 clock hours with the objectives as noted by Dr. Blauch's committee, the scope and material content of the American Chemical Society's Committee on Professional Training and the instruction to be given from the pharmaceutical point of view.

---

The University of Washington, Seattle, announces the development of its research and graduate program in the pharmaceutical sciences, especially in the field of pharmacognosy. The primary objective in the graduate program in pharmacology is to train persons for research and teaching in this field, or that of the related biological sciences, pharmacology and plant chemistry. Other pharmaceutical pursuits, such as industry and government service are likewise held in full cognizance, **but in keeping with the need for sufficiently trained teachers and research personnel** the staff is endeavoring to direct the program predominantly toward their current interests and needs. At the moment, the university has excellent facilities and an organization for carrying out the graduate program, and requests interested students to make application for registration. A reserve of teaching assistant fellowship and scholarship funds is made available for qualified students. The recently equipped and expanded plant laboratories, greenhouse facilities, and five acres of medicinal plant gardens make for excellent opportunities for persons seeking graduate training in physiology, chemistry and botany of drug plant substances. For additional information address Dr. Heber W Youngken, Jr., University of Washington.

## The Present Status of Pharmacognosy and Its Proper Place in the Pharmacy Curriculum\*

KENNETH REDMAN  
University of Georgia

Beginning with the Cleveland meeting of the American Pharmaceutical Association in 1944, considerable discussion concerning pharmacognosy and its status in the pharmacy curriculum has been in evidence. While it has been possible to find some specific comments on pharmacognosy in the literature, there has been considerable talk not easily identified. Urdang<sup>1</sup> has pointed out that "in the English speaking world there is an astounding lack of knowledge about the real meaning of pharmacognosy and its difference from, as well as its relation to pharmacology even among those who ought to know . . ." Moreover, even many of the printed comments probably have been misleading to a great many people that have not taken the trouble to carefully evaluate them. It seems desirable, therefore, (1) to find out what some of the present day leaders of American Pharmacy are thinking about pharmacognosy, (2) to critically examine the present status of pharmacognosy, and (3) to establish its proper place in the pharmacy curriculum.

### *Historical Introduction*

Part of the troubles that have always beset man have been ills and man has always been treating his ills in one way or another. Tye<sup>2</sup> has pointed out that "the therapeutic substances employed by man in his age-long struggle with disease have been multiform and various. At one time or another practically every known substance, whether of an-

---

\*Presented before the Section on Education and Legislation, A.Ph.A., San Francisco Meeting, 1948.

The author is indebted to Dr. George Urdang for constructive criticisms.

imal, vegetable or mineral origin, has been pressed into service. But though all classes of substances have been used at all times, there has generally been, during any given period, a trend toward the use of one particular class. This trend from earliest times to almost modern times, has often been determined by therapeutically irrelevant factors, such as availability, superstition, fashion, authority and tradition."

Tye<sup>2</sup> claims "it is fairly certain that in prehistorical times the most common drugs were of plant origin. . ." and the study of available documents, beginning with the Egyptian papyri (ca 1600 B. C.) and continuing on down to Dioscorides' *De Materia Medica* (ca 70 A.D.), indicates not only that drugs of vegetable origin predominated but also that their use was dominated by Galen's "special brand of humoral pathology"<sup>2</sup> for more than the next 1500 years. Polypharmacy, empiricism and superstition have thus been important features of therapeutics until almost modern times, with empiricism and superstition also being strong influences on all science.

The situation of all science up to about the sixteenth century has been described by Cameron<sup>3</sup>: "the doctrine of determinism had been a tight, hard binding; event was clamped to preceeding and succeeding event with rigid unalterability. You had to have it that way. The battle for the lawfulness of the universe had been intense, bitter. Mystic and transcendental interpretations of events have an immensely ancient history. In the old ways of men's thinking, supernatural powers could break in at any point in a sequence of happenings. But if this was to be, there could exist no scientific laws, there could be no possibility of prediction, and man was back on his knees again, a suppliant and no aspiring master of this world. For the early scientist, event was deterministically handcuffed to event, so that none could escape and nothing unpredictable could break in to these long chains."

It was in this atmosphere of determinism, although actually undermining it, that the Swiss physician, Paracelsus

employed such metals as mercury and antimony in the treatment of syphilis and used other inorganic compounds in the treatment of disease. Thus, as Tye<sup>7</sup> has indicated, the conception of a specific came into being, and "so for the first time in the history of therapeutics the trend was away from plant-drugs and polypharmacy and towards chemicals and specifics." The changed conception of therapeutics resulted in Dale's *Pharmacologia* in 1693, and thus "a rational therapy was finally emphasized as the goal of the science of medicine, the knowledge of drugs being only one of the means of achieving this goal." Regardless of the importance of this new science of pharmacology, however, Urdang<sup>8</sup> doubts whether it "would have achieved its generally recognized place. . . had it not been for the fact that just at this decisive time (in the early nineteenth century) pharmacy took over the descriptive part of the 'materia medica' of old. . . and developed it into a science working with modern means on the systematic identification of drugs and their botanical, physical, and chemical classification," i.e., pharmacognosy.

Seydler<sup>9</sup> is credited with the introduction of the term *pharmacognosy* in 1815. It is derived from the Greek "pharmakon, drug and gnosis, knowledge of drugs, pharmacology; esp(ecially) as a branch of natural history relating to medicinal substances in their natural or unprepared state. . .". Almost from the very conception of the new science, however, and before it was in reality established by Guibourt in 1820, the discovery, first of morphine by Serturner and then of other physiologically active plant constituents (alkaloids, glucosides) re-established the trends toward specific therapy and away from polypharmacy. The situation is concisely stated by Urdang<sup>8</sup>: "Chemicals became widely used remedies. The vegetable drugs, insofar as their usefulness was too obvious to be denied, were investigated as to their assumed efficient constituents in order to isolate by chemical means a chemical substance which was supposed responsible for their effect. Alkaloids, glucosides, and vitamins are the most important results of this development."



There had to be a reason why pharmacy took over the young science of pharmacognosy and developed it to its modern concept—a pharmaceutical science based on botany, zoology and chemistry devoted to the knowledge of drugs of animal and vegetable origin. The obvious reason was necessity. Crude drugs and the preparations were often efficacious even if used empirically, and the laity, as well as some physicians continued to use these remedies. Thus, in the United States as late as 1940, 258 crude drugs were official in the U.S. Pharmacopoeia and National Formulary, not to mention their constituents and preparations, “patented” and other proprietary preparations.

“While pharmacognosy as the science dealing with drugs of animal and vegetable origin was slowly but surely establishing itself, the era of therapeutically used organic chemical synthetics started, substances neither isolated from animal or vegetable sources nor modelled after such isolated plant products. It may suffice to mention the synthesis of antipyrin by Knorr, of acetylsalicylic acid, and the chain of sedatives with the barbiturates as their main representatives. It cannot and shall not be denied that in more recent times the helpfulness of our theories on the relationship of chemical constitution to pharmacological action has been proved in a number of cases, for instance as to the new antihistamines.

“With the discovery of bacteria and their role in causing and spreading disease, the idea of a ‘specific’ for each infection seemed to have become a new scientific basis. Ehrlich’s success with arsphenamine and the theory of chemotherapy based on it has exerted a far going influence which, after a period of disappointment of hopes for a final eradication of all sickness by systematically developed chemotherapeutical agents, has been given a new impetus by the sulfonamides and the so-called antibiotics.

“However, just the members of this latest group of therapeutical agents, derived as they are from natural

sources, prove definitely that natural sources are still furnishing us with new material for study and investigation and are still asking and will continue to ask for attention and the knowledge and employment of adequate methods. In other words: even if we agree that the search for 'specifics' is important, although not *the* goal of scientific endeavour in the field of drug therapy, does that diminish the importance and necessity of the study of drugs of animal or vegetable origin? As a matter of fact, it does not. After all, one of the earliest 'specifics' to arouse the indignation of the Galenists was Cinchona bark, and we still do not know exactly whether the one alkaloid, quinine, is the final answer, or whether the sum total of the alkaloids of the miracle bark, totaquine, has, for one reason or the other, to be preferred."<sup>11</sup>

### *The Present Status of Pharmacognosy*

#### *Opinions versus Facts*

*Opinions:* Swain<sup>12</sup>, in an editorial entitled "Dear Old Pipsissewa," stated that "Modern pharmacy has very little to do with pipsissewa" and criticised state boards of pharmacy for forcing colleges of pharmacy to teach obsolete material in their courses. More recently Swain<sup>13</sup> has said that "The truth is that much of *materia medica*, pharmacy and pharmacognosy hark back to the good old days of medical empiricism and polyglot prescriptions. Ever hear of Farfara? Senecio? Erigeron? Zedoaria?"

"These and many more like them are still being taught by our pharmacognosists who, of all our educators, hate to give an inch."

Powers<sup>14</sup>, in a comprehensive treatment of trends of official drugs has graphically illustrated the trends and present status of official organic, inorganic and botanical drugs. Powers<sup>15</sup> concludes from his study that "it is probably reasonable to expect that these trends (in general a decrease in his arbitrary classification of botanical drugs, and an increase in organic drugs) will continue in the same

directions in subsequent revisions of the United States Pharmacopoeia and National Formulary. It may develop in the future, as some writers have recently predicted, that a renewed interest in botanical drugs will occur. If such a program does develop, however, it will probably be aimed first toward determining the activity of the botanical drug and then isolating in pure form and characterizing the nature of the principles to which the activity can be attributed. If the active principles thus determined give promise of application as useful drugs, it is not unreasonable to expect that closely related synthetic drugs or analogs will eventually be developed to replace the active plant principles. It appears that the period of fluidextracts, tinctures, and other extractive preparations is rapidly drawing to a close."

Cook, in a private communication concerning a remark that he was alluded to have made to a representative of a publishing house that has come out with a new edition of a pharmacognosy text, says in part: "I would . . . . question the wisdom of any publisher financing a new text book on pharmacognosy for use in the pharmaceutical field. First the use of vegetable drugs in medicine has almost disappeared, except in some of the older proprietary preparations. Modern textbooks on medicine give little consideration to vegetable drugs. The drug Ergot should not be used in any form because of the uncertainty of its effectiveness and stability—every possible need is supplied by the dependable and stable alkaloids. Even the use of *Digitalis* is of questionable importance today in the opinion of many heart specialists who are using *Digitoxin* or some of the other glycosides. *Acacia*, *Tragacanth*, and probably *Agar*, *Belladonna*, and *Cascara* are still used by many physicians. No doubt there are other vegetable drugs still used, but I believe you will find that *The Pharmaceutical Survey* . . . will indicate that the pharmaceutical student needs a minimum of training in pharmacognosy today since he rarely sees the crude drug in practice, even should he work with a large pharmaceutical firm.

"The modern field of knowledge in pharmacy has expanded into chemistry and pharmacology, and no matter how distressing the facts to those who are interested in pharmacognosy, one cannot ignore these facts. I think that those who are interested in pharmacognosy should now turn to pharmacology, where they have unlimited opportunities."

In the preliminary draft of a report on pharmacognosy in The Pharmaceutical Survey, the committee<sup>23</sup> has said that "Pharmacognosy as taught in many schools of pharmacy is now in need of drastic revision" and refers to the fact that "It is no longer necessary to make plant anatomists out of undergraduate pharmacy students through the courses in pharmacognosy." The committee has also proposed to include such things as insecticides and fungicides in the course in pharmacognosy, to drop the taxonomic classification of drugs in favor of a biochemical or pharmacological classification, and other changes. Two of the committee members, Schwarting and Youngken, Jr.,<sup>24</sup> have expressed the same ideas independently and have also proposed the addition of insect physiology, allergens, etc., as proper material to be included in pharmacognosy.

*Facts:* Gathercoal and Wirth,<sup>25</sup> in a study of official drugs, have pointed out the difficulty of classifying drugs (for the basis of study). Some basic drugs are produced commercially from both natural and synthetic sources. Should such drugs be included in pharmacognosy as constituents of crude drugs, or should they be classified strictly as organic or inorganic chemicals, as the case may be? Apparently trying to be logical and at the same time reasonable, these authors in their tabulation of all U. S. Pharmacopoeial and National Formulary drugs, have excluded organic drugs largely produced synthetically from their tabulation of plant or animal products, but have included the rest under several headings, including plant chemicals. They define plant chemicals to "include alkaloids, glucosides, distilled oils and waters, expressed oils and fats, extracted acids, sugars and juices, etc." For convenience then, all basic drugs of the U. S.

Pharmacopoeia and National Formulary are here arbitrarily classified into three groups: (1) botanical drugs, (2) inorganic drugs, and (3) organic drugs.

In this study, the term botanical drug is arbitrarily defined to include all crude drugs of plant or animal origin and all of their basic constituents largely obtained from natural sources. All well characterized organic compounds largely produced synthetically are arbitrarily defined as organic drugs.

It may be noted that there is a close correlation between the basic drugs of the U. S. Pharmacopoeia XIII and the National Formulary VIII, as is shown in Table I. Another important factor to be noted is that over 50 percent of the official basic drugs are botanicals as is here classified.

TABLE I

Official Basic Drugs\*

	N.F. VIII		U.S.P. XIII	
	No.	Per cent	No.	Per cent
Botanic	177	55.4	216	53
Inorganic	81	25.4	98	24
Organic	61	19.2	93	23
Total	319	100.0	407	100.0

Powers<sup>14</sup>, in his study of official drug trends, indicates about 41 percent each of botanical and organic drugs and 18 percent of inorganic drugs in the National Formulary VIII as compared to about 19 percent botanical drugs, 59 percent organic and 21 percent inorganic drugs in the U. S. Pharmacopoeia XIII.

*Questionnaire:* In order to more adequately discuss some of the criticisms of pharmacognosy, a questionnaire was devised to not only get facts from representative schools of pharmacy, but also opinions from representative pharma-

\*Based on a tabulation made by Gathercoal and Wirth<sup>15</sup>.

ceutical educators. The questionnaire was sent to sixteen schools or colleges of pharmacy in various sections of the United States. The questionnaires were divided among deans and pharmacognosists. Four deans and six pharmacognosists, representing nine schools or colleges replied in time to be included in the study. \* \* The required undergraduate work in pharmacognosy taught at these schools or colleges is given in Table II.

TABLE II

Semester Credits (Pharmacognosy)

School	Didactic	Macroscopic	Microscopic	Total
Creighton	2	1	0	3
Drake	4	1	1	6
Texas	6	0#	0	6
Washington				
State College	5	0	2	7
Arizona	6	1	1	8
Buffalo	6	0	2	8
Florida	6	1	1	8
Purdue	10	2/3	2/3	11 2/3
Massachusetts College of Pharmacy	8	1	3	12
Average	4.8-	0.6#	1.2-	7.8-

#Laboratory work is given without credit.

Concerning course content, all who answered were agreed that official plant parts, constituents of plants or animals and chiefly prepared from natural sources, and plant or animal parts, unofficial, but sources of official drugs should be included in an undergraduate course in pharmacognosy.

Eight of the ten people answering the questionnaire thought that official animal parts should be studied, while six were definitely in favor of scientific names. Six people wanted to include antibiotics and constituents of plants or animals but chiefly prepared synthetically. Five persons wanted to include plant or animal drugs formerly official,

\*\*Appreciation is expressed to Deans Brillhart, Dirstine, Lyman and Jarrett and to Professors Albers, Hocking, Carl H. Johnson, Voss, Younken, Sr. and Zufall for kindly cooperating with the questionnaire.



enzymes, insecticides, fungicides, herbicides, and rodenticides. Four or less persons wanted to include vitamins, serums, vaccines, toxins and hormones. Other things suggested by one or more individuals for a course in pharmacognosy included: local poisonous plants and especially those poisonous to livestock, allergens, and gums, resins, waxes and dyes of vegetable origin commonly handled by pharmacists, and surgical raw materials.

Five people were in favor of abandoning the taxonomic and morphological classifications in deference to a chemical, therapeutic or pharmacological classification. Only four people, including a dean concurring with his professor, said that state board of pharmacy examinations influenced them to include obsolete or otherwise irrelevant material. Only two people, and they from the same school, concurred with the idea that "the modern field of knowledge in pharmacy has expanded into chemistry and pharmacology,—and that those who are interested in pharmacognosy should now turn to pharmacology, where they have unlimited opportunities."

Dirstine<sup>15</sup> has commented on this statement, in part as follows: "We are deleting obsolete material from our work but we are certainly not yet willing to acknowledge that pharmacy is nothing more than chemistry and pharmacology. Anyone that has that idea should spend a few months behind a counter of a real drug store. In other-words I think your question . . . is absurd." Lyman<sup>16</sup> commented in part as follows: "I would say that pharmacy has *not* expanded into chemistry and pharmacology. Rather would I say that chemistry and pharmacology and therapeutics have become more essential agents to be used in the investigation and teaching of pharmacognosy."

#### *Discussion*

Since The Pharmaceutical Survey is now making a survey of pharmacognosy, no attempt has been made to make a complete study of the subject to show the status of official basic drugs and their relationship to a course in pharmacognosy. How do the facts compare with the opinions?

*Type of Subject Matter:* The fact is that over fifty per cent of the official basic drugs are botanical. The term "botanical" as here used is based on an historical as well as a modern concept of drugs that properly belong in a course in pharmacognosy. The discrepancy between this study and the Powers' study lies in the definitions of the terms. Powers has included basic crude drugs in his tabulation of botanicals and has put "all well characterized and pure organic compounds whether of *natural* (the italics are the author's) or synthetic origin, and all salts and inorganic derivatives of organic acids and other organic compounds" in his class of organic medicinal chemicals. This obviously is not a true index as to the proper content of a course in pharmacognosy and to repeatedly put large graphs of the basic official drugs in this arbitrary classification before large gatherings, such as our national pharmaceutical conventions, could not help but leave a wrong impression concerning pharmacognosy. All who saw the graphs and who did not meticulously study the article upon which the graphs were based would get the idea that not many drugs were left for pharmacognosy, for the term "botanical drug" has long been associated with pharmacognosy. It is entirely possible that even some pharmacognosists have been victims, for it seems hard to assign anything but near panic to such proposals as to include insect physiology in pharmacognosy, evidently trying to compensate for the decline in other subject matter.

Assuming, first, that it is axiomatic that all official drugs should be taught in a pharmacy curriculum, and second, that all official crude drugs and all official constituents of crude drugs largely derived from plant and animal sources should be taught in a course in pharmacognosy, we now have a minimum of 393 drugs to be included in such a course. In addition, the importance of unofficial drugs can not be overlooked, for as Kremers and Urdang<sup>17</sup> have pointed out "The fact that the pharmacist is the trustee of the entire medical needs of the people, responsible for having the remedies desired by them in stock and in good condition, and

also for the reliable preparation and preservation of all remedies, old as well as new, official and non-official, makes the profession an indispensable part of the public health service." On this basis, one can hardly agree with Cook when he says "the use of vegetable drugs in medicine has almost disappeared . . ." As for the value of *Digitalis* and other official drugs in medicine, the revision committees will have to settle that, for as long as the drugs are official they should be included in a course in pharmacognosy. While it is true that there has been an "evolution in processing and supplying medicines and pharmaceutical substances" which must be recognized, we nevertheless should not lose sight of the Kremers-Urdang statement that "the vegetable kingdom has at all times supplied more items for the apothecary's *materia pharmaceutica* than have the mineral and animal kingdoms combined." It appears, then, that there are even sufficient official drugs suitable for a thorough, fundamental course in pharmacognosy at this time, without the necessity or desirability of including unrelated material.

*Credit Hours:* Reference to Table II shows that of the nine reporting institutions the total required semester credits in pharmacognosy vary from a minimum of three to a maximum of twelve, with an average total under eight credits. Microscopic pharmacognosy varies from 0 to 3 credits, averaging about 1.2 credits. Here, then, is a situation in which one school requires as much microscopic pharmacognosy as another school requires for its complete course. Voss states that, "at Creighton the pharmacognosy has been reduced to three semester hours, and time formerly devoted to pharmacognosy has been given to pharmacology and public health. Although we cover some material of *slight practical value* (the italics are the author's) because of state board examiners, we have found that three hours is an adequate amount for our purposes." It is difficult to see how this course, or any other similarly abbreviated course could have any more than "slight practical value." On the basis of this limited survey, it hardly seems, however, that even in the case of the Massachusetts College of Pharmacy,

devoting three semester credits to microscopic work, schools of pharmacy are trying "to make plant anatomists out of under graduate pharmacy students through courses in pharmacognosy."

There may be some that would abolish all laboratory work in pharmacognosy, both microscopic and macroscopic, the argument being that such training is not necessary in the modern drug store. This type of logic could be carried a little further to eliminate the study of all pharmacy, since there are so-called "drug stores" today that advertise for registered pharmacists and use as the "incentive", the "no prescriptions" legend to attract pharmacists. A pharmacist's service can be no better than his training, and if we keep giving him less and less scientific training, because some of them use such training less and less, or not at all, we will end up giving no training and having no profession. No one is arguing for, nor does there exist an elaborate program of laboratory study in pharmacognosy. However, since there are 226 official drugs,<sup>2</sup> most of which, at least, have macroscopical and microscopical descriptions, an average of less than two semester credits devoted to these two phases hardly appears out of line. After all, the U. S. Pharmacopoeia and National Formulary are legal standards required as part of the minimum drug store equipment in many states. If a pharmacist is not to be able to at least intelligently read these standards, then who is?

*Course content:* Elaborating on Swain's<sup>10</sup> criticism that many drugs such as Farfara, etc., "are still being taught by our pharmacognosists, who of all our educators, hate to give an inch,"<sup>11</sup> Swain has indicated in a private communication that he based this statement from an impression he got at a meeting of the Boards and Colleges of District No. 1. In addition he says that he does not "insist that this is a general rule . . ." An indication that Swain's claim should not be a "blanket" indictment of all pharmacognosists is revealed in several ways. First, the results of the questionnaire reveal that only three pharmacognosists (and in-

cidentally two deans) proposed the study of formerly official crude drugs, and even this with some qualification. Second, only one pharmacognosist (and three deans) have said that state boards of pharmacy influence them to include obsolete or otherwise irrelevant material. Swain is still of the opinion, however, that much obsolete material is to be found in pharmacognosy courses. No evidence so far produced indicates that this is so. The indication that any irrelevant material is taught comes mostly from the deans. There is some indication, then, that Swain's suggestion for better cooperation between the boards and colleges is in order.

*Taxonomic and morphological classification:* The questionnaire indicated opinion equally divided and equally positive on this question. The committee in the preliminary draft of a report on pharmacognosy for The Pharmaceutical Survey, although admitting several advantages for the taxonomic and morphological classifications, proposed the use of either a biochemical (chemical) or a pharmacological classification, although admitting disadvantages to the latter two. A study of this report reveals that the main reason for this suggested change is to better fit in the insecticide, etc., subject matter. Since it has already been pointed out that there is no necessity or real reason to include such material, the committee proposal for change of classification is a moot question. Lyman has gone so far as to propose a pharmacological classification of drugs for a series of pharmaceutical texts, including pharmacognosy. He points out that the doctor uses a pharmacologic-therapeutic classification in his work, that the druggist arranges the stock in his store on that basis, and that the layman goes into the drugstore for a pharmaco-therapeutic reason. If Lyman could get a series of texts on pharmacy, including pharmacology and pharmacognosy and all based on the *same* pharmacological classification, his proposal would be as fine in practice as it is in theory. To use the present hodge-podge pharmacological classifications that exist however would certainly be confusing to the student, for he would be expecting correlation and would find little. For example, in the outline suggested



by The Pharmaceutical Survey Committee, "adsorbents" are classified under "Pharmaceuticals," whereas Davidson<sup>11</sup> classifies "adsorbents" under "Drugs Acting on or in Gastrointestinal Tract" and Sollmann<sup>12</sup> has no such classification at all. For the present, it seems best to let the taxonomic-morphological classification stand.

*Current Scientific and Medical Status:* According to Cameron<sup>13</sup> "the scientific worker has now less and less reason to fear that, into his work, into his own thinking, there will once more erupt the ancient magical, the old transcendental ways. They are all but gone, and what remains is dying.

"But as we grow bolder, more and more of us are beginning to raise the question of whether the idea of a final truth is not simply a lingering remnant of our urge to anthropomorphize our universe—to provide our anxious-minded selves with some final fixed point. Certainly nothing in our experience justifies our thinking that there is any such thing as an ultimate."

Scientists are now abandoning the idea of a single cause to produce a single reaction or disease, indeed, Cameron<sup>14</sup> says that "now we are approaching a period when the whole concept of cause may be abandoned in favor of a hypothesis of chains of event sequences continually interacting with, and modifying, each other."

In the field of medicine, Wolf<sup>15</sup> has pointed out that there is now added impetus to the gathering of body evidence against the old pathologic concept that specific agents give rise to pathognomonic tissue disturbances.

"Clinically, the concept of 'nonspecific' patterns of reactions gains support from the study of bodily changes incident to chronic exposure to arsenic. Most of the symptoms of arsenic poisoning may also be induced by other chemical, physical or bacterial agents." Even in chemotherapy the



advantages of multiple sulfonamide therapy have at last been demonstrated, and in the case of the plant product, penicillin, the less "pure" amorphous variety is preferred to the "pure" crystalline product.<sup>28</sup> Synthetic penicillin is conspicuous by its absence. Other crude drugs or natural products still usually preferred to their constituents or synthetic homologs, if any, include: Thyroid to Thyroxin, Vanilla to Vanillin, Natural vitamin B complex to the synthetic, Insulin and Estrone.<sup>29</sup> It may be mentioned, too, that Sucrose is the pure organic chemical produced in greater quantities than any other, synthetic or natural. Thus, at present, trends toward nonspecifics and polypharmacy, and an increasing lag, proportionately, between the discovery and use of natural products and their synthetic homologs is discernable.

It is these natural products that historically and functionally have a place in pharmacognosy, and it is here that we need a national referee to get and keep the pharmaceutical curriculum and textbooks straight. Granting that a certain amount of repetition is an aid to the learning process, certainly this thing can be carried to an excess which is a waste of time. Take Vitamin A for example. The student may grow slightly weary from the discussion in "American Pharmacy"<sup>30</sup> to Pharmacognosy<sup>31</sup>, "Chemistry of Organic Medicinal Products"<sup>32</sup>, "Pharmaceutical Dispensing"<sup>33</sup>, and "Pharmacology"<sup>34</sup>. If this is not enough, the student may find his "old friend" again in courses in biological products, proprietary remedies, or veterinary products. There may be some merit to Swain's<sup>35</sup> proposal for a "de-junking" of the pharmaceutical curriculum, but there seems to be more opportunity to eliminate duplication rather than obsolete material, as Swain has suggested.

*The Future of Pharmacognosy:* While this paper has been concerned primarily with the present status of pharmacognosy, the necessity for natural products to continue to lead the way in the relationship between chemical structure and pharmacological action, and the lag in time between the discovery of the natural product and the development of a

superior analog, especially by totally commercial synthetic means, leads to a prediction for a need for pharmacognosy in the near, foreseeable future. Since there are no final scientific facts and everything is relative, the only certain prediction for things to come in pharmacognosy, pharmacy, medicine, and all science, is continued change. Let us recognize the present needs in pharmacognosy, then, for what they are, and not for what they may be some time in the future.

### *Summary and Conclusions*

1. Some present day leaders of American Pharmacy, especially those not directly connected with teaching, believe that there is not much, if any, need for pharmacognosy.

2. There are 393 official drugs (over 50 percent of the basic drugs) chiefly obtained from plant and animal sources which traditionally and functionally belong to a course in pharmacognosy.

3. The statement that the "vegetable kingdom has at all times supplied more items for the apothecary's materia pharmaceutica than have the mineral and animal kingdoms combined" is still correct, even when applied to our official basic drugs.

4. A limited survey of schools and colleges of pharmacy indicates that an average of less than eight semester credit is now required in pharmacognosy. With the number of official drugs to be taught, it is obvious that the courses are taught in an efficient manner.

5. In a previous well publicized survey of trends of official drugs, the arbitrary classification of "botanical drug" was not a true index of the course content for pharmacognosy. Undoubtedly this has given the wrong impression to many people, for the term "botanical drug" has long been associated with pharmacognosy.

6. Some obsolete or otherwise irrelevant material has been stated by a few educators to be taught in pharmacognosy

courses, the reason given: to satisfy state boards of pharmacy. This suggests the need for closer cooperation between the colleges and boards of pharmacy.

7. It does not appear desirable to change from the taxonomic and morphological classifications of drugs as a basis of study at this time.

8. At present, there is confusion and much overlapping of effort, at least as far as pharmaceutical textbooks are concerned. It is likely that some of this trouble extends to the courses in pharmacy involved. This suggests the need for better editing of pharmaceutical texts and good cooperation among pharmacy staffs.

There will be a need for pharmacognosy in the future, which is aptly expressed by Lyman<sup>16</sup>: "I am one of those who believe that as long as the world lasts the Creator will have some use for the plant cell to convert water and CO<sub>2</sub> into sugar and do a lot of other things that will need to be done while the synthetic chemist is asleep. Even if the synthetic chemist reaches a point where he makes everything on our tables out of coal, the time may come when he will still need the plant to produce coal, or even the sparkling diamond. And the same applies to drugs. I question that the time will ever come when we can dispense with the pharmacognosist, and I am sure as the years go by the modern pharmacognosist can make his subject become more and more indispensable."

## References

1. Urdang, G., *Am. J. Pharm. Ed.*, **9**, 206, (1945)
2. Tye, A., *Austral. J. Pharm., New Ser.* **28**, 1033 (1947)
3. Cameron, D. E., *Science*, **107**, 554, (1948)
4. Urdang, G., *Sci. Monthly*, **60**, 161 (1945)
5. Youngken, H. W., *Text-Book of Pharmacognosy*, ed. 5, The Blakiston Co., Phila. 1943, p. 3.
6. Murray, J. A. H., *A New English Dictionary*, The Clarendon Press, Oxford, 1909, Vol. 7, pt. 2, p. 767.
7. *Ibid.*, p. 768

8. Kremers, E., and Urdang, G., *History of Pharmacy*, ed. 1, J. B. Lippincott Co., Philadelphia, 1940, p. 43.
9. Swain, R. L., **Drug Topics**, **91**, No. 9, 17 (1947)
10. *Ibid.*, **92**, No. 9, 17 (1948)
11. Powers, J. L., **Bull. Nat. Form. Comm.**, **14**, 121 (1946)
12. *Ibid.*, 128
13. Gathercoal, E. N. and Wirth, E. H., *Pharmacognosy*, ed. 2, Lea and Febiger, Philadelphia, 1947, p. 28.
14. Powers, *Ibid.* pp. 124, 125
15. Dirstine, P. H., Private Communication
16. Lyman, R. A., Private Communication
17. Kremers-Urdang, l. c., p. 43
18. (Committee), Preliminary Draft of a Report, *Pharmacognosy in the Pharmaceutical Curriculum*, The Pharm. Survey, 1948, p. 8.
19. Kremers, E., and Urdang, G., l. c., p. 344
20. Voss, E., Private Communication
21. Gathercoal, E. N., and Wirth, E. H., *Ibid.* p. 28
22. Davidson, F. R., *Synopsis of Materia Medica, Toxicology and Pharmacology*, ed. 1, C. V. Mosby Co., St. Louis, 1940, p. 95.
23. (Committee), *Ibid.* p. 6.
24. Swarting, A. E., and Youngken, H. W., Jr., **Am. J. Pharm. Ed.**, **11**, 708 (1947)
25. Sollmann, T., *A Manual of Pharmacology*, ed. 7, W. B. Saunders Co., Philadelphia, 1948.
26. Cameron, D. E., *Ibid.*, p. 554
27. *Ibid.*, p. 556
28. Wolf, S., **Science**, **107**, 637 (1948)
29. (Editor), **Pulse of Pharmacy**, p. 18 (March, 1948)
30. (Editor), **Therapeutic Notes**, **55**, 87 (1948)
31. Lyman, R. A., *American Pharmacy*, ed. 1, J. B. Lippincott Co., Philadelphia, 1945, p. 471.
32. Gathercoal, E. N. and Wirth, E. H., *Ibid.* p. 663.
33. Jenkins, G. L., and Hartung, W. H., *The Chemistry of Organic Medicinal Substances*, ed. 2, John Wiley and Sons, Inc., New York, 1943, pp. 94, 287.
34. Husa, W. J., *Pharmaceutical Dispensing*, ed. 3, Husa Brothers, Iowa City, Iowa, 1947, p. 587.
35. Sollman, T., *Ibid.*, p. 79
36. Swain, R. L., **Drug Topics**, **92**, No. 13, 13 (1948)
37. Urdang, G., Private Communication.

## Remembering Lima A Travelogue

GEORGIANNA SIMMONS GITTINGER  
University of Maryland

I can't recall just when I began to think of visiting Lima. Hostories of Pizarro's conquest and various tales of South American adventure made the city a definite entity. Besides my travel dreams usually included a circuit of the southern continent, touching ports and capitals.

Perhaps it was Dr. Carlos Enrique Paz Soldan's first book about the Malaria of the Count of Chinchon which gave me a desire to know more about the city which he described so vividly. After that there was more reading, a correspondence was initiated and writings exchanged with Dr. Paz Soldan, professor of hygiene in the University of San Marcos, over our mutual interest in the history of medicine, and allied subjects. A few years later Dr. Juan B. Lastres, professor of psychiatry and of the history of medicine in San Marcos, was added to my list of Latin American friends. This naturally increased my desire to see their city and their university, the oldest in the western world.

Finally sufficient funds and a vacation period materialized, and traveling by Pan American Airways, I was able to spend most of the month of July 1948 in Lima.

I had written the two professors of my plans, and received a note from Dr. Lastres, who is also secretary of the Peruvian Society for History of Medicine, of which Dr. Paz Soldan is president. He said there would be a meeting of the Society while I was there, at which I would be officially received, since I had been elected a corresponding member two years before.

In Lima I stayed at a Criollo hotel instead of the obvious tourist establishments. It gave me more opportunity

to practice speaking Spanish and met with the approval of my Limenan friends, who unanimously praised its food.

These included in addition to the university group, friends of a Baltimore friend, who extended the kindest hospitality I have ever received from strangers. Now the Cebrians are also my own friends.

The old part of Lima with its criss-cross of narrow streets and its historic squares, Plaza de Armas and Plaza San Martin, is a fascinating place to ramble afoot. And the grander, more modern city expanding beyond it in broad avenues and great circular plazas with fine houses and splendid public buildings filled me with admiration.

It was winter there, and the generally grey skies were lightened only occasionally by brilliant sunlight. But trees were green, bouganvillea and golden shower vines rioted over the houses and garden walls, and the parks and larger squares were glorified by tall geraniums and other vivid plants.

The Cebrian family invited me to their beautiful home, and drove me about the surrounding areas, and down to the shores of the Pacific. I explored Lima alone, venturing into every open church door to revel in the beauty of carved wood and gilt and candle light. I saw viceregal palaces, now museums, and the splendid archeological museum at Magdalena Vieja, with its matchless collections of water jars and pre-Inca embroidered cotton cloths and feather mantles.

Dr. Paz Soldan called the meeting of the Peruvian Society of History of Medicine for July 15, to meet jointly with the National Academy of Medicine. Their rooms are in one of the old downtown streets, opening from a spacious patio. The Academy was welcoming Dr. Pi-Suner, medical director of Winthrop's Laboratories as an honorary member, and the society receiving me officially. We each had a brief address (I read mine), and then the institution. When they handed me my beautifully engrossed certificate I found to my surprised delight that it reads "Miembro Honorario."



Next evening Dr. Lastres took me to the Bolivar to a cocktail party which Winthrop's were giving for Dr. Pi-Suner. There I met again some of the audience of the preceding night, and other pleasant and friendly people.

Dr. Lastres had taken me to visit the Laboratorios Maldonado, after I had met Dr. Maldonado at a luncheon party at the Crillon. He has a large well equipped pharmaceutical plant with both ornamental and experimental gardens. His great pride, however is in his historic exhibits. He showed me the museum he is constructing to house his extensive collection of ancient porcelain and glass pharmacy jars, his mortars and mixing bowls and antique instruments; all of which I viewed with appreciation.

Dr. Carlos Bambaren, professor of pharmacology, whom I'd met at the Pi-Suner cocktail party, took me to visit the school of pharmacy which is located in the city's botanic garden. The school is small, has some fine equipment, but lacks the extensive library they crave.

Alone I explored the university proper, liberal arts, law and economics, a long building with classic patios and arcades, facing University Park. I saw only the exterior of the medical school, because other engagements prevented a conducted tour of that. But I did get inside one of the fine modernistic hospitals.

There were several purely social engagements, and the shopping for silver and leather goods dear to the heart of any woman. I liked Lima, but it was not till the departing airplane circled over the vast web of lights marking its streets, that I realized how much genuine affection I'd developed for the City of the Kings.

## The Precedents of the N. A. R. D. and Its Founding Fifty Years Ago

GEORGE URDANG  
University of Wisconsin

When, in 1852, the American Pharmaceutical Association was founded, professional pharmacy in the United States was a goal rather than a reality. The task was to make professional men out of business people. What wonder that the commercial interest of the American pharmacist did not receive much attention by their national Association, that there even was a tendency of definitely excluding matters of commercial concern from its proceedings. How far this went, became very obvious when at the A.Ph.A. Niagara Falls meeting of 1882 the suggestion was made to delegate five members as messengers of good will to the next meeting of the Western Wholesale Druggist's Association which had been founded in 1876.

Even the gentleman who, on the ground that "withal the interests of the two associations are to a certain extent identical," made the suggestion, emphasized that "the objects of the two organizations are different to some extent. One is a business association; the other a scientific." Its opponents were, naturally, still more definite. It was said that it does not seem proper for the A.Ph.A. to "recognize a mere trade organization," and another defender of the exclusively professional aims of the A.Ph.A. expressed himself as follows: "I believe the retail and the wholesale trade must have a common ground where they may meet . . ., but I do question whether this association [the A.Ph.A.] is exactly the road where they join." The

---

\*Presented at the joint session of August 12 of the Section on Historical Pharmacy of the American Pharmaceutical Association and the American Institute of the History of Pharmacy, San Francisco Meeting, 1948.

motion to send delegates was finally carried. There were, however, 20 nays against 45 ayes<sup>1</sup>.

Nevertheless, there was in 1882 a strong feeling among the retail pharmacists of the United States, including those organized in the American Pharmaceutical Association, to go together with the organized wholesalers who, on their meeting of the same year, were transforming themselves into a national organization and adopting the name "National Wholesale Druggists' Association."

This feeling was materialized in 1883 with the establishment of the "National Retail Druggists' Association," a name obviously intimating the close connection between the two groups. The wholesalers as well as the retailers felt themselves endangered by a growing tendency towards a direct manufacturer—consumer connection and by the rapidly expanding evil of price cutting. The trend towards agreement and cooperation was strengthened by the fact that quite a number of wholesalers conducted simultaneously retail drugstores, hence were immediately interested in the welfare of both branches of the trade.

#### *The National Retail Druggists' Association*

The new venture was inaugurated by a concerted action of the presidents of 23 State Pharmaceutical Associations and, against common belief, was not fought but supported by the then leading men in the American Pharmaceutical Association. The "call for a convention to meet in Washington, D. C., Monday, September 10, 1883 (being the day previous to the meeting of the American Pharmaceutical Association) for the purpose of organizing a National Trade Association of Retail Druggists," sent out under the date of March 22, 1883, was signed not only by the president of all but two of the then existing and functioning State Pharmaceutical Associations, but "also by the president and treasurer and three members of the Council of the American Pharmaceutical Association." The American Journal

<sup>1</sup>Proc. A.Ph.A., 30: 633-636, 1882.

of Pharmacy, edited by the permanent secretary of the American Pharmaceutical Association, John M. Maisch, commented on this invitation as follows: "The unanimity which is thus seen to prevail, is of itself proof of the necessity of such organization, and of the good which it may accomplish."

The circular named as the main tasks of the new organization "relief from ruinous competition in proprietary articles and its antidote, the retail rebate plan; relief from burdensome and unjust taxation; the preventing of our business being diverted into the hands of grocers and dry good dealers." It stressed that "it is not intended that this association shall at all interfere with the American Pharmaceutical Association, whose functions are almost exclusively scientific, but to work entirely in harmony with it."

There had been one event which made this appeal still more attractive to the rank and file of the American pharmaceutical retailers. The Massachusetts druggists, the main initiators of the new movement, had in the year before, in 1882, started a similar local association of their own, and "the retail rebate plan" referred to above had apparently met with some favor by those on whose agreement its success or failure depended, the jobbers and the manufacturers. This rebate plan as adopted by the Massachusetts Pharmaceutical Association determined:

"That the manufacturers of proprietary articles sell their goods to those jobbers only who will agree to sell them at the rebate price to those retailers only (druggists or otherwise) who shall sign an agreement not to sell to consumers, directly or indirectly, at less than the marked retail prices except that six packages may be sold for the price of five. To all other customers the jobbers shall sell only at the marked retail price. The manufacturers, when dealing directly with retailers of their goods (whether drug-

---

<sup>1</sup>*Am. Journ. Pharm.* 55: 219, 220, 1883.

gists or other dealers) to exact the same written guarantee to maintain the full marked prices.”

On September 10, 1883, the about two hundred druggists, assembled at Washington, D. C. in order to create the “National Retail Druggists’ Association” and to adopt a Constitution and By-Laws, were asked to accept the Massachusetts rebate plan as article two of the Constitution of the new organization thus making this plan, its introduction and safeguarding, the main objective of the new group. It is remarkable that the assembly hesitated to make this plan, based as it was on a supposed agreement with wholesalers and manufacturers, a permanent part of its constitution, and that it was a substitute recommended by Joseph P. Remington, then Chairman of the Council of the American Pharmaceutical Association, which was accepted instead. In the modification given to it by Mr. Remington, article two of the Constitution of the N.R.D.A. stated that the “object and aim of this Association shall be to unite all retail druggists for the purpose of obtaining protection in their business interests from evils known to exist and for mutual support and co-operation.” There could hardly be a more sweeping declaration of purpose.

The whole matter of a plan of action was referred to the Executive Committee, consisting of fifteen members, and to the same committee was also referred a resolution “that a Committee be appointed to receive complaints from members regarding jobbers and manufacturers who sell to consumers direct at wholesale prices, ignoring the retail trade and that lists of houses so doing be published for the benefit of members of the association.” There was furthermore resolved “that a committee of three be appointed to act in co-operation with the committee from other associations to urge upon Congress the repeal or modification of the tax upon alcohol when used exclusively for mechanical or medicinal use.”

<sup>1</sup>Drugg. Circ. & Chem. Gaz., 27: 147, 1883.

The organizers of the N.R.D.A. and their followers were sure of their success. The Secretary of the new organization, J. W. Colcord of Lynn, Massachusetts, expressed himself in his first manifesto, "A review of the Washington Convention of Retail Druggists" as follow:

"Can the leading object sought in organization be obtained, namely, protection at the hands of manufacturers and jobbers? Leading manufacturers and jobbers who have carefully looked over the situation assure us that if the movement is as general as would seem to be indicated, and if a sufficient number of retailers demand it, few of them would care to refuse to grant it, any more than would the retailers the demands of their customers—the consumers."

Riding that high, it was no wonder that the people attending the Constitution meeting did not pay much attention to the only warning voice raised amidst the wave of enthusiasm sweeping over the assembly. It was Albert E. Ebert of Chicago, past-president of the A.Ph.A. (1872-73), who voiced the opinion that "the objects of the meeting could be attained without going into expense and forming the machinery of organization." In vain did he cite "as for instance of the uselessness of organization, the conference of teaching colleges," pointing to the fact that, "although the conference made strong professions of concerted action, it was now, after ten years of sickly existence, a dead organization in everything except its name."

When on September 11, 1883, one day after the founding of the N.R.D.A., the thirty-first annual meeting of the American Pharmaceutical Association was opened by its President, Charles A. Heinitsch of Lancaster, Pennsylvania, he included in his official address the following recognition of the new group: "The foundation stones of a National Retail Druggists' Association have already been laid, and its permanent establishment upon a firm and substantial

<sup>1</sup>*Ibidem*, 27: 170, 1883.

<sup>2</sup>*Ibidem*, 27: 147, 1883; the Conference of Teaching Colleges (Schools) of Pharmacy to which Mr. Ebert referred was founded in 1870.



basis is now a certainty. In view of the fact that we have so much in common with this new body, the proposition to exchange delegates might fairly be considered."

The first reaction on the part of the wholesale druggists and manufacturers of proprietaries seemed likewise quite favorable. Meetings of representatives from the Proprietor's Association, the National Wholesale Druggists' Association and the National Retail Druggists' Association, held during the first year of existence of the latter, resulted in the adoption of the "Campion plan," named after the Philadelphia pharmacist, J. W. Campion who had formulated the slight modification of the original "Massachusetts plan" which it represented. A joint committee was organized under the name "The Druggists' Protective Association" with permanent headquarters at Philadelphia.

At the first meeting of the new group after its founding, taking place at Milwaukee on August 25, 1884, the President, Henry Canning of Boston, was able to relate that "up to this time the plan has been at least a partial success" and that "there are now 118 signers, representing eighty or ninety preparations." He was all the more optimistic as to further progress as the new group in this first year of its existence had jumped from 200 to about 2500 members. Since the American Pharmaceutical Association had at this time not more than 1472 members, the N.R.D.A. had become by far the largest pharmaceutical organization in the country. It was but human that under these circumstances President Canning predicted that his Association "a year hence will show a membership of ten thousand," and that he treated the American Pharmaceutical Association in a rather condescending manner. Referring to the A.Ph.A. as "our older and much beloved sister" he expressed himself as follows:

"Our Organization was instituted for the sole purpose of fostering the legitimate interests of the retail drug trade . . . Many of us are members of both bodies; and we do

not want to see our grand old American Pharmaceutical Association trammelled by the introduction of the "affairs of the shop." Let both Associations, however, each in its own sphere, follow the same course and to the same end—that is, the steady advancement of pharmacy."

It was in recognition of the concept expressed by Mr. Canning that on the following day, on August 26, 1884, the President of the A.Ph.A., William S. Thomson of Washington, D. C. in his official address expressly declined to discuss "the proposed methods for accomplishing fair prices in the sales of these articles [proprietary], for that properly belongs to a kindred organization . . . ." Nevertheless, while there was at the N.R.D.A. meeting at Milwaukee a very encouraging talk by a representative of the National Wholesale Druggists' Association, there was neither an A.Ph.A. delegation present nor a more or less official welcome extended on the part of the older association.

Although recognizing the new organization as justified in principle, the A.Ph.A. apparently thought it wise to wait with any official steps until further development had proven the stability of this so suddenly emerged and so quickly expanded venture.

The events following the Milwaukee triumphant meeting of the N.R.D.A. proved the adequacy of this cautious reserve. The development has been described as follows:

"The Campion plan had been tried by a few proprietors and was reported to work satisfactorily providing as it did for a 'cut off' of those who sold at less than list prices or those who supplied cutters. The wholesalers at their meeting in 1884<sup>1</sup> were cold to the plan, believing that it was wholly impracticable. At the same time, they were in sympathy with the retailers in their desire to solve their

<sup>1</sup>*The Daily Druggist* No. 1. Special by *The Druggist* of Chicago, issued at Milwaukee on August 26, 1884.

<sup>2</sup>*Proc. A.Ph.A.*, 32: 479, 1884.

<sup>3</sup>This meeting was held at St. Louis in the second week of Oct., i. e., about eight weeks after the Milwaukee meeting of the N.R.D.A.

problem. Accordingly, an endorsement was given to the "Campion plan until the parties most in interest (the retailers) adopt some more acceptable plan." This was the beginning of the issuance of lists of price cutters from whom supplies were to be withheld. The Campion did not succeed and in 1885 the proprietors abandoned it altogether."

When at Pittsburgh on September 7, 1885, the National Retail Druggists' Association held its second meeting after its founding, there could not be any doubt in the fact that the idea of eliminating the evil of pricecutting by concerted action of all parties concerned, the manufacturers of proprietaries as well as the wholesalers and the retailers, had been defeated. There was a general flight of the disappointed membership not only but partly even of the leaders. The President, Henry Canning, bitterly disappointed by the attitude of the wholesalers, had resigned on the first of January 1885 "owing to failing health," and the first Vice-President, Lucius Lybrand of Noblesville, Indiana, merely sent his address, excusing his absence from the meeting with the pressure of his "private affairs."

Hence, to quote the report in a leading drug trade magazine "the meeting, in the absence of the proper officers, was called to order by E. A. Sayre who nominated Mr. A. H. Hollister as presiding officer." The report of the treasurer showed that of the 2500 members, of which the N.R.D.A. could boast at Milwaukee a year ago, 1500 had not paid their dues, a lack of interest "which may be explained by the failure of the Campion plan, many members undoubtedly believing the Association organized for nothing but to regulate and correct cutting of prices."

A hectic effort was made to keep the Association alive by reminding its members that other matters of financial concern, for instance the liquor revenue license, the tax on alcohol and a mutual insurance plan, were adopted with the

<sup>9</sup>A History of the Nat. Wholesale Drug. Ass., New York 1924, pp. 35, 36.

<sup>1</sup>Drug. Circ. & Chem. Gaz, 29: 215, 216, 1885.

aim to make the N.R.D.A. a kind of representative national roof organization of the Pharmaceutical State Associations.

This idea seemed to have a good chance. On the next meeting of the association, held at Providence on September 6 and 7, 1886, it was reported that twenty State Associations (of 32) had endorsed the plan. It was on the basis of this report that the National Retail Druggists' Association was transformed into a new organization which, also under the old name, was to be composed of regularly authorized delegates from Pharmaceutical State Associations. Again a note of great expectation was sounded. The newly elected President, A. H. Hollister of Madison, Wisconsin, stated that the reorganized N.R.D.A. "ought to have at least 1500 delegates at these meetings." Nevertheless at the end of the Providence meeting a resolution was suggested by the former President, Mr. E. A. Sayre, and adopted by the Assembly which, after all this fanfare, sounded somewhat amazing. "Mr. Sayre moved that a committee of five, including the president, be appointed to confer with the American Pharmaceutical Association in regard to amalgamation."<sup>1</sup> Whether the propagandists of the idea of a special commercial organization of the American pharmacists liked to admit it or not, after the sudden collapse of the action against the pricecutters the majority of their followers had lost every interest and, to quote from E. A. Sayre's report at Providence "let it go by default." And yet, this spontaneous uproar of the retail druggists for the sake of their business interests could not remain without consequences.

It certainly was not accidental that in the afternoon of the same day, September 7, 1886, the President of the A.Ph.A., Joseph Roberts of Baltimore, in his official address named "among the causes of this waning popularity and consequent loss of usefulness . . . of this Association . . . that tendency . . . to exclude from our proceedings everything other than strictly scientific pharmacy, or science

<sup>1</sup>*Ibidem*, 30: 233, 1886.

pertaining thereto," adding that "to maintain the status of this Association as the national representative of the interests of the pharmacists of the United States, you cannot ignore any interest that pertains to either the science or the art of pharmacy, or that affects the welfare of pharmacists."<sup>12</sup> His further recommendation that the "State Associations be officially invited to communicate with this Association in their corporate or State capacity upon any and all questions of pharmaceutical interest that may seem to them of national importance"<sup>13</sup> betrayed definitely the intention of constructing a close and permanent connection between the A.Ph.A. and the Pharmaceutical State Associations making the existence of another nation-wide representation of the latter unnecessary—if not even impossible.

There was no doubt that, inspite of open and concealed resistance on the part of the conservative old timers, there was at this moment a growing tendency within the American Pharmaceutical Association to change its organization in such a way and to such an extent that, to quote Mr. Roberts, "any interest . . . that affects the welfare of pharmacists," including their commercial ones, could be effectively taken care of within the frame of the A.Ph.A. What was needed, was a man, decided and able to conceive such a reorganization. This man was there and his name was Joseph P. Remington of Philadelphia.

The role played by Remington as a teacher, chairman of the Committee on Revision of the U.S. Pharmacopeia, and author of a text-book which lived to see many editions and enjoyed the widest circulation, has overshadowed the recognition of his importance in the organizational life of American pharmacy. He always sensed the temporary needs and his great diplomatic talent enabled him to find the most fitting compromise. As stated above, it had been Remington who in the organizational meeting of the National Retail Druggists' Association had offered a compro-

<sup>12</sup>*Proc. A.Ph.A.*, 34: 130, 1886.

<sup>13</sup>*Ibidem*, 34: 134, 1886.

mise as to the wording of article two of the constitution of the new group widening the avowed purpose to protection of the retail druggists in their business affairs from whatever "evils known to exist" instead of limiting it to the fight against price cutting.

Now again Remington had some widening of purpose to achieve, this time within the American Pharmaceutical Association.

In his presidential address quoted above Mr. Roberts had suggested "to inquire through proper committees or otherwise whether there be a better plan than that at present in use for its [the A.Ph.A.'s] management."<sup>14</sup> This suggestion was eagerly taken up by the men who thought a change necessary. A resolution appended to the President's address and asking for the appointment of a Committee on Management was adopted and J. P. Remington made Chairman of this "Committee to consider and report on the future management of the association."<sup>15</sup>

*The Creation of an A.Ph.A. "Section on  
Commercial Interests"*

It was not a mere change of management but a complete reorganization of the American Pharmaceutical Association which was worked out in 1886-87 by the Committee, in cooperation with the leaders of the N.R.D.A. and with the support of one of the ablest organizers in American Pharmacy, George J. Seabury, founder of the firm of Seabury and Johnson, the mother concern of Johnson and Johnson. The plan of reorganization was presented by Joseph P. Remington to the 1887 Cincinnati meeting of the American Pharmaceutical Association and accepted without much discussion. The feature of special importance to those aiming at a better protection of the business interests of the American pharmacists was the formation of four sections with far going powers of self-administration

<sup>14</sup>*Ibidem*, 34: 130, 1886.

<sup>15</sup>*Ibidem*, 34: 182, 1886.



and decision "to expedite and render more efficient the work of the Association" including on second place, after a "Section on Scientific Papers," a "Section on Commercial Interests" (By-Laws, Chapter IX, article II) and reserving the third and fourth sessions for the business of the Section on Commercial Interests. There was provided, furthermore, close cooperation between the Section on Commercial Interests of the A.Ph.A. and the Pharmaceutical State Associations.<sup>16</sup> Thus the scene was set for the return of the prodigal son or, as Acting President, Henry J. Menninger, put it in his address on September 5, 1887, for "the marriage of the American Pharmaceutical Association to the National Retail Druggists' Association."<sup>17</sup>

On September 7, 1887, the National Retail Druggists' Association was officially dissolved and the "Section on Commercial Interests" of the A.Ph.A. installed with the last President of the former, A. H. Hollister, as the chairman of the latter. In his acceptance speech Mr. Hollister said the following:

"From my very first connection with the two Associations, at Milwaukee, I felt thoroughly convinced that there should be no necessity for the two associations."<sup>18</sup>

Nevertheless, the dissolution of the National Retail Druggists' Association and the opportunity for the discussion of, and action on, commercial problems offered by the reorganization of the A.Ph.A. were apparently not regarded by all concerned as the final answer to the needs of the pharmaceutical retailers. A number of local business organizations, among them especially the Chicago Retail Druggists' Association, remained active and, encouraged by their success in reaching some of their goals at least to some extent on a local level, others were founded. It soon became evident that the A.Ph.A. Section on Commercial Interests with the moral weight of the A.Ph.A. at its command,

<sup>16</sup>*Proc. A.Ph.A.*, 35: 493, 1887.

<sup>17</sup>*Ibidem.* 35: 439, 1887.

<sup>18</sup>*Ibidem.* 35: 513, 1887.

could be used rather effectively in drafting and negotiating agreements with the wholesalers and proprietors on the main question concerned, namely price cutting, that it, however, was entirely beyond the scope of the Section to exert adequate supervision and safeguarding of the plans agreed upon.

Hence the formation of such a supervising body was to be expected after the acceptance of the so called tripartite plan, deriving its name from the fact that three parties (the A.Ph.A., the N.W.D.A. and the Proprietors' Association) had consented to it. This body was founded in 1891 under the name of Interstate-Druggists' League. It was made the guarantee of the tripartite plan by the A.Ph.A. in 1893. "The Commercial Section," said its Chairman, W. H. Torbert of Dubuque, Ia., "has been relieved entirely of its responsibility in the execution and supervision of the plan." He stressed, however, the obligations of the A.Ph.A. "to make such suggestions and recommendations to the officers of the Interstate League and offer them such assistance . . . as this Section may deem expedient."<sup>10</sup>

The fact that the Interstate Druggists' League was not able to effectively do the job, that means to warrant an adequate observance of the tripartite plan, and could not prevent the practical collapse of the plan in 1895 deprived it of its *raison d'être*. Once again there was a vacuum, only partly filled by the local organizations of retail druggists mentioned above. It was from the most active of these local groups, the Chicago Retail Druggists' Association, that in 1898 the suggestion was made of a new national trade association devoted not only to an attempt to cut down the cutters but to the active pursuit of the totality of the commercial interests of the American pharmacists. The leaders of the Chicago group took it for granted that the A.Ph.A. had to admit its lack of efficiency in the practical and continuous pursuit of these interests and should assist and no bemoan the new venture. In a letter read before the A.Ph.A. Section on

<sup>10</sup>*Ibidem*, 41: 336/37, 1893.

Commercial Interests at Baltimore on August 30, 1898 and advocating the founding of "a National Association of Retail Druggists," the President of the Chicago Retail Druggists' Association, Thomas V. Wooten, said the following:

"In furtherance of our efforts, we need and deserve the moral support of the Commercial Section of the American Pharmaceutical Association."<sup>20</sup>

Again it was Joseph P. Remington whose sensitivity for the needs of the moment and talent of bridging differences paved the way for a mutually helpful understanding. After some discussion of the suggestion offered by the Chicago druggists a Committee of the A.Ph.A. Section on Commercial Interests, formed at the instigation of and headed by, J. P. Remington submitted the following resolutions which found the approval of the assembly:

"Whereas, the need of a national organization which shall occupy itself exclusively with the commercial needs of the retail drug trade in the United States is apparent; the interests of the retail druggist having been ignored repeatedly by other bodies, including our Government, this always resulting in pecuniary loss; therefore be it

"Resolved, That whilst it is not in the power of the American Pharmaceutical Association officially to aid in the organization of the proposed Retail Druggists' Association, whose call for a convention is based on the advance in prices of proprietary and patent medicines, that this Association heartily desires the success of every organized effort of retail druggists which will protect their commercial and pecuniary interest.

"Resolved, That a copy of these resolutions be forwarded to the President of the Chicago Retail Druggists' Association and to the Secretary of the National Druggists' Association when organized."<sup>21</sup>

As pointed out before, it had been likewise with the consent of the then leading men in the American Pharma-

<sup>20</sup>*Ibidem*, 46: 133, 1898.

<sup>21</sup>*Ibidem*, 46: 142, 1898.

ceutical Association that in 1883 the first national association devoted exclusively to the protection and promotion of the commercial interests of the American pharmacists was founded. But there had been much opposition too, regarding the initiators and followers of the commercial group as dissidents who had to be brought back into the fold. In the meantime, however, these gentlemen of the A.Ph.A. had learned their lesson.

From 1893 to 1897 inclusive, the meetings of the A.Ph.A. Section on Commercial Interests had been characterized by a frantic lookout for some group or groups willing and able to take over whatever action was required. When, in 1895, it had become clear that the Interstate Druggists' League could not fill the bill, the Section declared it of vital importance that permanent local associations should at once be effected everywhere to correct such abuses as exist" and pledged the support of the A.Ph.A. "to any well directed efforts made by such organizations. . ."<sup>22</sup> At the 1896 Montreal meeting the Chairman of the Section on Commercial Pharmacy flatly stated that the conditions which had existed in 1895 "leave the questions then discussed unchanged and unsolved."<sup>23</sup> No resolution of any substantial meaning was passed. In 1897, finally, at the A.Ph.A. Minnetonka Bench (Minn.) meeting, a man was elected chairman of the Section on Commercial Interests who, although an excellent businessman, was admittedly opposed to the main purpose of the Section, the fight against price cutting; Mr. Joseph Jacobs of Atlanta, Ga. In his acceptance speech Mr. Jacobs said the following: "I have rather been at variance with what I understood to be the object of the Commercial Section . . . I think you have made an arch cutter chairman of the Commercial Section, and a fellow who is proud of being a cutter." And challenged by the ironical remark, "We thought that would settle the cut-rate question," Mr. Jacobs added: "if you intend to kill the Section you are going at it in a proper

<sup>22</sup>*Ibidem*. 43: 165, 1895.

<sup>23</sup>*Ibidem*. 44: 98, 1896.

manner; but I think it would probably be better to disband the Section at once and be done with it."<sup>21</sup> No wonder that an editorial in one of the then leading pharmaceutical magazines called this election the addition of "another farcial element to the comedy of errors which was begun with the formation of that Section."<sup>22</sup>

Although doing injustice to the Section by not considering its importance as a forum for discussion and clarification of the problems concerned, this editorial remark was significant of the opinion held by the majority of the American retail druggists of this period. Hence it was with a sigh of relief and wholeheartedly that in 1897 the American Pharmaceutical Association gave its consent to the founding of a national instrumentality for a kind of activity which had been proved beyond its power. The resolutions quoted above were not only well put but well meant.

*The National Association of Retail Druggists.*

On October 17, 1898, the National Association of Retail Druggists was founded at St. Louis with the object "to unite the representatives of associations of retail druggists in the United States in a central body for the improvement of the business conditions of the retail drugtrade" (Constitution, Article II). The prominent position of the A.Ph.A. was recognized by granting it "five delegates to all meetings of the Association" (Constitution, Article III, Section 3).

Led by men of energy and experience, the development of the new organization would nevertheless have been questionable, had they committed the same mistake which had made their predecessors a failure from the very beginning: to entrust the enormous amount of work to be done to the voluntary endeavor of temporary officers. Deciding in 1899 to make one of the most instrumental Chicago initiators of the new organization, Thomas V. Wooten, its permanent and full time secretary, the members of the N.A.R.D. removed one of the greatest dangers, decay by default.

<sup>21</sup>*Ibidem*, 45: 119, 1897.

<sup>22</sup>*Drug. g. Circ. & Chem. Gaz.*, 41: 273, 1897.

Since this paper is devoted to the prehistory of the N.A.R.D. leading up to its founding rather than to its development during the half century of its fruitful existence, only a very scanty survey of this development can be offered at this place.

It was the good luck of the new organization that it succeeded in a matter which was of immediate concern at just this time, thus proving its usefulness at the first occasion given and in a case of obvious importance. This matter was the war tax imposed on proprietary medicines and toilet articles after the Spanish-American war and intended to become a permanent burden of taxation for the retail trade. The following extracts from an article published in the *N. A.R.D. Journal*<sup>1</sup> as to "a few of the major activities of organized pharmacy in the development of which the N.A.R.D. is entitled to full credit" give an idea of the success claimed by this organization for the time until 1931.

After having stated that the savings of the retailers through the elimination of the Spanish-American war tax "exceeded by a wide margin the sum total of all the moneys paid into the national association in the form of dues from 1898 down to and including the present year" (1931), the article tells that each of the several plans to put an end to predatory price cutting "was thoroughly tried out and in each instance brought some relief" and dwells on the "very gratifying results" produced by the revived so called tripartite plan." "When it become clear," the article says, "that the laws on the statute books then, as now, stood in the way of concerted action of any kind to remedy the cut price evil, the N.A.R.D. promptly entered the legislative field." It has been the endeavor and the constant vigilance of the N.A.R.D. in "the legislative field" which has yielded much to pharmacy and has prevented still more. It is common knowledge that the present Fair Trade laws owe their existence and especially their maintenance, to a very great extent to the initiative, the support and the valiant and

<sup>1</sup>*N.A.R.D. Journal*. 52: 629, 1931.



skillful defense on the part of the N.A.R.D. Another activity stressed in the article and effectively continued is the endeavor of the N.R.D.A. to popularize the prescribing and use of U.S.P. and N.F. products.

The relations between the A.Ph.A. and the N.A.R.D., although subjected to argumentation, borderline disputes and sometimes to human—all too human differences like everything in the world of man, have gained rather than lost in intimacy and mutual understanding in the course of time.

On December 12, 1943, finally, an agreement has been concluded granting the American Pharmaceutical Association and the National Association of Retail Druggists mutual representation on a number of committees of both organizations and making meetings of the presidents, the secretaries and the chairmen of the executive bodies of the A. Ph.A., and the N.A.R.D. a permanent institution.<sup>21</sup>

Founded in September 1898, the National Association of Retail Druggists is now celebrating its fiftieth anniversary. It enters its second half century with the satisfaction as well as with the responsibility resulting from a job well done. It is with the greatest of pleasure that this author extends to the jubilee and is meritorius secretary, Mr. John W. Dargavel, his best wishes for the future.

---

<sup>21</sup>*Journ. A.Ph.A., Pract. Ed.*, 4: 394, 1946.\*

---

A special announcement from the Executive Committee shows the total enrollment in colleges of pharmacy for the academic year 1948-49 to be 20,019. Of this number 18,815 are in the 64 member colleges reporting and 1,204 in the 5 non-member colleges reporting. Classified by years and other designation, 3,979 are freshmen; 5,676 are sophomores; 5,501 are juniors; 4,430 are seniors; 81 are special students; and 352 are graduate students. 2,261 of those admitted were given advance standing and 220 possessed degrees before entering. 255 students withdrew during the year.

## Fifty Years of History of the University of Texas College of Pharmacy\*

CARL CLARENCE ALBERS

University of Texas

With the introduction of pharmaceutical instruction by Prof. Albert Prescott at the University of Michigan in 1868, and the establishment of the department of pharmacy at the University of Michigan in 1883, the experimental stage of pharmaceutical instruction in state universities was about ended. In the next ten years, several state universities followed the example of these two pioneering institutions. The Twenty-third Texas Legislature, which ended its session on May 9, 1893, passed a general appropriation bill which designated a sum of \$2,500 in the budget of the Medical Branch of the University for the establishment of a school of pharmacy.<sup>1</sup>

This apparently simple beginning was not without a considerable effort on the part of the druggists of the state. At least twenty-five petitions were presented to the Legislature asking that a chair of pharmacy be established at the Medical Branch at Galveston. Some of them were signed by "physicians," some by "druggists," some by "citizens," one by the President and Secretary of the Texas State Pharmaceutical Association," which shows the universality of the requests. Full credit should be given to the Texas Pharmaceutical Association for arousing interest in the establishing of the chair.

The first recorded interest in the project occurred during the Fourth Annual Convention of the Association, when

\*This paper, which was read before the Joint Session of the Section on Historical Pharmacy of the American Pharmaceutical Association and the American Institute of the History of Pharmacy at the 1948 San Francisco meeting, is a condensation of the original paper made necessary because of the available space, and has the approval of the author.—Editor.

the president, E. M. Wells, recommended the appointment of a committee "To endeavor to secure a chair of pharmacy at the University," which had been established and was to open its doors in the fall of 1883. President Wells is to be commended for his foresight in seeking to have the chair of pharmacy established at the very beginning. F. J. G. Zethraens, a prominent druggist of Paris, Texas, supported the recommendation, but W. J. Morley of Austin contended that "It would be best to postpone action until proper legislation can be had regarding pharmacy, and until the Medical Branch of the University is organized." Mr. Zethraens supported this suggestion, and the Association renewed its efforts which had already begun in 1880 to secure legislation regulating the practice of pharmacy in the state.

This effort bore fruit in 1889 when the first pharmacy law became effective in Texas. This was two years before the Medical Branch was established at Galveston. The Association then renewed its efforts toward the establishment of a chair of pharmacy, and in the same legislative session, through the efforts of Mr. Rogers of Anderson County and Mr. Feagin of Polk County, a bill was passed which included \$2,500 for the chair. While Governor James Stephen Hogg did eliminate a number of items from the appropriation bill, the one establishing the chair of pharmacy was not one of them.

#### *The Establishment of the School*

With the legal basis for establishing the school having been met, the board of regents in June of 1893 approved a motion establishing the "School of Pharmacy" at the Medical Branch, and ordered a professor of pharmacy be sought at a salary of \$2,000 per annum. A laboratory fee of \$5 was ordered assessed against each student, and the faculty should consist of a professor of chemistry, one of materia medica, and one of pharmacy.'

Galveston was chosen as the location for the Medical Branch, supposedly because of better clinical facilities; and

it should be noted that two of the eight regents were medical men, one was president of the board, and one a resident of Galveston. The pharmacy law passed at that time fixed the qualifications for the practice of pharmacy at two years' experience in a drug store where physicians' prescriptions were compounded, followed by the passing of satisfactory examination before a board of pharmacy which was also created by the same act. The law also gave recognition to graduates of regular incorporated colleges of pharmacy that required two years of similar experience before issuing a diploma by exempting such graduates from the board examination, and requiring them merely to pay a registration fee of three dollars. Needless to say, the apprenticeship route became and remained the most popular procedure for qualifying for the examination until 1929 when the law was amended to require graduation from a recognized college of pharmacy as the prerequisite. These facts will help one to understand the size of the student body in the school in those early years. Locating the school of pharmacy in conjunction with the Medical Branch was an economical procedure, but it also provided a close supervision by the medical group of the pharmaceutical curriculum, an arrangement that may or may not have always advanced the interests of pharmacy.

#### *The First Occupant of the Chair of Pharmacy*

The first occupant was selected by a Medical College Committee consisting of Drs. T. C. Thompson, T. D. Wooten, and Mr. T. M. Harwood. There were more than fifty applicants, and Dr. James Kennedy, a practicing physician of San Antonio, was recommended as first choice by the committee. The regents approved this selection, and Dr. Kennedy was elected professor of pharmacy at the \$2,000 annual salary.<sup>5</sup> No record of the qualifications of the other applicants is available. But the selection of Dr. Kennedy, to all reports, had the approval of the medical journals of the state, and there is no record that the appointment was not satisfactory to the Texas Pharmaceutical Association. He had been a practicing pharmacist before taking up the study

of medicine. The *San Antonio Daily Express*, at the time of his death on March 30, 1895, gave a brief account of the accomplishments of this remarkably versatile man that is of interest. He was born in Louisville, Kentucky, in 1863, and during his early youth sold newspapers to help support himself and his parents. At the age of ten, he found employment as a bottle washer in the drug manufacturing firm of Arthur Peter and Company of Louisville. He was industrious and reliable, and when he attained the age of young manhood, his employers rewarded his ability by sending him to the Louisville College of Pharmacy from which he was graduated in 1884 "with high distinction." He then returned to the firm and was placed in charge of the manufacturing laboratory. After a short time, he was forced to leave, because of ill health, and find a more salubrious climate. He arrived in San Antonio in 1885 and found employment in the store of Elliot and Ragland. His diligence and devotion won him a partnership in the firm upon the retirement of Mr. Elliot a year later. He was instrumental in organizing the San Antonio Pharmaceutical Association, and was its first president. During his tenure in the chair of pharmacy, he was active in the state association work. He never gave up the idea of studying medicine, and finally sold his interest in the store and enrolled in the New York Medical College from which he was graduated with highest honors in 1890. He then returned to San Antonio and was engaged in practice when he was appointed to the chair of Pharmacy in 1893.

He entered upon his work with great zeal. He declared that while the school was as well equipped as any in the country at that time, "the facilities for the proper training of pharmacists were not what they should be." Both of these statements could easily be true. The climate at Galveston was incompatible with his health. This forced him to return to the practice of medicine at San Antonio, and he died on March 29, 1895. Thus ended the brilliant career of a pioneer in pharmaceutical education at the age of 32 years.

*The Second Occupant of the Chair of Pharmacy*

Immediately following the resignation of Dr. Kennedy the board of regents assigned the task of selecting his successor to the Medical College Committee. The committee consisted of the same two physicians as originally, and Mr. Beauregard Bryan. From a number of applicants, Raoul Rene Daniel Cline of Houston was elected professor of pharmacy for one year at the formerly established salary of \$2,000.\* Among the other candidates with comparable qualifications was L. Meyers Connors of Dallas, a graduate of St. Louis College of Pharmacy, and at that time president of the Texas Pharmaceutical Association. He was highly recommended by a number of distinguished men.

Mr. Cline was a native Texan and not yet 27 years of age when he was elected to the chair. His early training was in the Houston schools. He attended Pennsylvania College at Gettysburg, Pennsylvania. He went to France to study pharmacy and received the baccalaureate from the University of Montpellier in 1889. While studying there, he taught English in the University. He then returned to the United States and enrolled in the New York College of Pharmacy, in order to obtain an American degree. He was graduated with the Ph.G. in 1891. He received the A.M. degree from Pennsylvania College in 1896. For a time he operated a drug store in Houston, studied law, was admitted to the bar and practiced law for a brief period in his native city. After his appointment to the chair of pharmacy, he took up the study of medicine "better to qualify himself as a teacher from the medical point of view." He graduated in medicine in 1909 with a high scholastic average. He retained his position in the chair of pharmacy for 29 years, until his death in 1924, and during his long period of devoted service, he won the esteem of students and colleagues alike.

Dr. Cline was succeeded by Prof. W. F. Gidley of Purdue University. Like his predecessors, Prof. Gidley had also studied medicine and lacked but a few courses to complete the re-



quirements for the degree. He had obtained his pharmaceutical training at the University of Michigan, had had experience in the Squibb laboratories, and later taught at Mercer University College of Pharmacy at Macon, Georgia, and later at Purdue University, where he was at the time of his appointment at Texas.

*The Removal of the Department of Pharmacy  
from Galveston to Austin*

Since the establishment of the chair of pharmacy, it had been administered by the dean of the medical faculty. Such authority left little by way of self determination on the part of the strictly pharmaceutical members of the staff and in the state. There apparently was a feeling on the part of the medical group that the teaching of such subjects as pharmacology to pharmacy students by others than medical teachers would lead the pharmacist to counter-prescribe. This belief also was responsible for the discontinuance of assigning pharmacy students to the medical section in materia medica and also delayed for a long time the introduction of courses in pharmacology into the pharmaceutical curriculum.

Even as late as 1926, when the regents gave autonomy to the college of pharmacy in order to meet the requirements for membership in the American Association of Colleges of Pharmacy, and appointed Prof. Gidley to the position of dean, it at the same time issued the injunction that "the Dean of Pharmacy must report through the Dean of the Medical Branch to the President of the University."<sup>21</sup>

However, the time had come when it was necessary to expand the pharmaceutical curriculum, and the instruction in cultural and basic courses. This raised the question as to whether it would not be more economical to move the college to Austin. It would also afford the college wider opportunity for development, and this opinion was shared by the Texas Pharmaceutical Association. Another factor which favored removal was that because of the more basic training

and the longer period of professional study required of medical students, a feeling of superiority over pharmacy students developed which lowered the morale of the latter. The pharmacy course still remained at two years.

To bring the matter of removal to a head, in October 1926, Mr. A. W. Griffith, a member of the executive committee of the Texas Pharmaceutical Association, presented an appeal to the board of regents, asking for the removal of the college to Austin.<sup>12</sup> The matter was referred to the Medical Branch Committee for investigation and further report. At the July meeting of the board, President Splawn took up the question and presented the following exhibits:<sup>13</sup>

(a) A petition from the Texas Pharmaceutical Association and telegrams from leading druggists favoring removal.

(b) An opinion from the Attorney General advising that the board of regents have the power to remove the college of pharmacy if they deemed proper.

(c) A letter from the professor of chemistry at the university pointing out the advantages of the proposed removal, and suggesting that it would result in a reduction of the teaching staff required for the work in chemistry.

(d) A report showing that the medical faculty opposed the move by a vote of 12 to 5.

After comments upon these exhibits by Dean Gidley, the regents voted to move the college to Austin in time for the opening of school in September, and later appropriated \$14,000 to cover the cost of removal.

Upon its arrival in Austin, the college, insofar as housing was concerned, fared but little better than it had in Galveston. The various departments were widely scattered on the campus, and still remain so. Nothing less than an exclusive building will succeed in bringing them under one roof.

At the May, 1940, meeting, the board of regents "authorized President Rainey to investigate the feasibility of

returning the college of pharmacy to Galveston." It is not clear what provoked this action of the board, unless it was a harbinger of what was to develop in the Rainey-Regent dispute several years later. But this belongs to another historical period.

#### *Length of School Term*

The term was lengthened to two sessions of 7½ months each in 1894-1895, to 8 months each in 1901-1902, to 3 academic years of 8 months each in 1925-1926. In 1927-27 session, after removal of the school to the main campus at Austin, the school year was divided into 2 semesters of 18 weeks each. The 4-year course was offered for the first time in the 1928-1929 session, but the 3-year course was not abandoned until several years later.

#### *Entrance Requirements*

In the 1897-1898 session the entrance requirements into the college were made uniform with those required to enter the Medical School and stipulated that the applicant be 17 years of age, possess good moral character, and pass an entrance examination. In 1905-06 applicants over 21 years of age were admitted on an "individual approval basis." In 1915-16 eight high school units were required for entrance, in 1921-22 the number of units was raised to 12, and in 1922-23 fifteen units or high school graduation were required.

#### *Classification of Courses*

In the 1910-11 session the courses were classified into "major" and "minor" subjects, but no explanations were provided for such division. Elective courses were offered for the first time in the 1929-30 session.

#### *Degree Plans*

In the 1937-38 catalogue 2 alternative plans were outlined for the pharmacy degree, the one designated as the Professional Pharmacy Curriculum and the other Commercial

Pharmacy Curriculum. These two plans remained in effect until the 1946-47 session.

#### *Degrees Offered*

The Graduate in Pharmacy degree (Ph.G.) was offered from the very beginning upon completion of the prescribed course of study. The Ph.C. degree for an optional three-year course was never awarded by the University of Texas, though the course appeared in the catalogue for the 1922-23 session. The B.S. degree was awarded for the first time in June, 1929, upon completion of a 4-year course of study. However, the Ph.G. degree was awarded for the last time in the 1935-36 session, and a total of 629 such degrees were awarded throughout the history of the college.

#### *Student Enrollment*

For the first time, in the 1922-23 session, the enrollment was fixed at 60 students for the freshman class and 40 students for the second year class. However, the enrollment never reached the 100 figure or above until the 1934-35 session when it attained the mark of 125. The maximum enrollment during the fifty year period covered by this report occurred in the 1939-40 session when it reached the 305 figure.

Under such conditions, the College of Pharmacy ended its first fifty years of history. Because of the limitations imposed by wartime restrictions there was no semi-centennial celebration, no recognition of this important milestone in the history of a College that is antedated only by the Schools of Medicine and Law, no fanfare of any kind to commemorate this important event!

Embarking upon its history 50 years ago with a staff of three professors, eleven students and a basement laboratory, the college ended this milestone with a staff of one professor, two associate professors, one assistant professor and one instructor and a student body numbering 170. But

a contemplation of the future with its increased opportunities, and responsibilities and possibilities cannot do less than awaken and inspire one to a greater measure of hope and achievement.

## References

- (1) Proceedings of the 23rd Legislature, State of Texas, House Journal, p. 1082, 1893.
- (2) Ibid., pp. 599, 600, 614, 622, 632, 657, 681, 700, 790, 802; Senate Journal, p. 335.
- (3) Proceedings of the Texas State Pharmaceutical Association, Fourth Annual Convention, 1883 (Unpublished) The writer is indebted to Mr. Walter D. Adams of Forney, Texas, past-president of the Am. Pharm. Ass. and long-time Secretary of the Texas Pharmaceutical Association, for the loan of certain scarce unpublished copies of the Proceedings of the Texas Pharmaceutical Association.
- (4) Minutes of the Board of Regents, University of Texas, June 21, 1893. R. A. 307
- (5) Ibid., Sept. 4, 1893, R. A. 396
- (6) **Texas Medical Journal**, 8:12, 57, 1892-93; **Transactions Texas State Med. Association**, 1892, p 57, **Ibid.** 1893, p. 63, **Ibid.**, 1894, p. 37
- (7) **Galveston Daily News**, Tuesday Oct. 3, 1893, p. 6, col. 1.
- (8) Minutes of the Board of Regents, Dec., 1894, R. B. 708
- (9) Ibid., May, 1895, R. B. 43
- (10) Daniel's Texas Medical Journal, 10, 1895, p. 614.
- (11) Minutes of the Board of Regents, Oct. 1926, G. 7
- (12) Ibid., Oct., 1926, G. 4
- (13) Ibid., July, 1927, G. 79
- (14) Ibid., May, 1940, N. 71

## An Editorial

### Pharmacy and the American Association of University Women

The fact that no college of pharmacy has been added to the list of institutions approved for membership in the American Association of University Women since 1945 may be of interest. It seems unlikely that member-colleges of the American Association of Colleges of Pharmacy accredited by the American Council on Pharmaceutical Education would fail to meet requirements. If they do it may be because an unusual number of their science courses are "professional" or "technical" in the opinion of the Committee on Membership and Maintaining Standards of the A.A.U.W. Probable explanation of not being on the approved list is that no one has put forth the effort to get approval. Since courses in member-colleges are not identical the American Association of Colleges can do nothing about it. *Each college* must ask for approval of *its course*.

Unquestionably many things about college courses are far more important than having them approved by A.A.U.W. No one would think for a moment that a curriculum should be planned with this in mind but when approval at least in most cases can be obtained simply by submitting certain information about the courses and other general information about the parent institution, why not do it?

Though women seem to have proved their right to become pharmacists and their fitness as well, they are likely to remain in the minority. Nevertheless, this approval of a national organization of women is due them. Few students are thinking about it now but after they have been out of college a few years they are quite likely to want to be members and certainly will be chagrined if they find that the degree awarded them has not been approved.



Thirty-nine of the universities and colleges of which member-schools of the A.A.C.P. are a part have had from one to five or more degrees, besides A.B. and B.S., approved. These degrees are of all sorts, but B.S. in Home Economics, B.S. in Nursing and B.S. in Commerce predominate. Home Economics and Nursing are almost limited to women and Commerce includes a good percentage of women. Even so, why not women who get a B.S. in Pharmacy?

Zada M. Cooper

---

The First Pan-American Congress of Pharmacy, which was held in Havana, Cuba, on December 1-8, and which was attended by representatives of every country of the Western Hemisphere except San Domingo, has designated The American Institute of the History of Pharmacy at the University of Wisconsin "as the center of the endeavor in the history of pharmacy in the Americas." Dr. George Urdang, director of the Institute, has announced that plans are now being worked out for a more fundamental representation of Latin American countries in the organization to broaden the investigational program in historical and social aspects of pharmacy. It is expected that there will be a trustee of the Institute in each of the 21 Latin-American countries. The Congress further approved a recommendation by its Section on History of Pharmacy in America that the Institute publish "a series of monographs on the history of pharmacy in all countries of the Western Hemisphere." Such studies will be authorized by historians of the various American countries concerned. The director of the American Institute of the History of Pharmacy was designated by the resolution to serve as the coordinator and general editor of the series of monographs. The aim will be "to produce, and to bring to the knowledge of the world at large, a concise survey of the development of pharmacy in the Western Hemisphere." Dr. Urdang served as president of the Section on the History of Pharmacy in America at the meeting. Designed to establish a better interchange of information on the professional, scientific, and educational aspects of pharmacy, this initial Congress resulted in the founding of a permanent Pan-American Federation of Pharmacy. Among the questions explored by the Congress was the unification of official drug standards and the possibility of establishing a Pan-American pharmacopoeia.

## The President's Page

Unavoidable circumstances have delayed the publication of the past few issues of the *Journal*. This permits, however, the publication in this issue of a few papers presented at the Jacksonville meeting which are quite appropriate at this time.

It would be impossible, in the limited space allotted, to present even the highlights of our recent meeting, however, considerable time was devoted to The Pharmaceutical Survey recommendation for a six-year program of pharmaceutical education. Careful study should be given to the report of the Committee on Curriculum, which after another year of careful study reiterates the belief that "the scope of pharmaceutical education at the level of the professional is beyond the physical capacity of" the four-year program and presents "desirable and definite reasons for an extension to a six-year program." This Committee recommended that our colleges accept no students after the fall enrollment of 1955 for the four-year curriculum, and recommended that with the fall enrollment of 1956 the member colleges "require two years of collegiate instruction, comprising a minimum of 64 semester hours, or their equivalent, of specified and elective subjects, for admission to a professional curriculum in Pharmacy comprising four years of collegiate instruction of not less than 128 semester hours, or their equivalent." The Association, by resolution, accepted these recommendations as written notice of a proposal to change the Constitution, and to be voted upon by the member colleges at the next annual meeting.

It is quite apparent that there is considerable opposition by a number of our member colleges to any lengthening of the program for pharmaceutical education in the immediate future, although there was little expression of such views upon the floor of the Convention. I would be one of the

last to question the sincerity of those holding the view that a lengthened program is not at present desirable. It is to be hoped that our college faculties will carefully study the papers and reports presented at the meeting in Jacksonville during the coming year and that the recorded vote at Atlantic City next year will be based not upon expediency, but upon a straight-forward policy based on sound principles for the advancement of pharmaceutical education.

Much publicity has been given during the past few months to a statement attributed to Dr. Edward C. Elliott, Director of The Pharmaceutical Survey, that the existing four-year program of education and training provides the essential knowledge and skills for the practice of pharmacy. Dr. Elliott, in Jacksonville, made it plain that he was only partially quoted and that an entirely different interpretation is expressed when fully quoted. To the quoted statement attributed to Dr. Elliott, the following, in substance should be added: for the practice of pharmacy today, but not for the practice of pharmacy of the future. (His exact words cannot be quoted as the minutes of the meeting are not at this time available.)

May I take this opportunity to express my thanks to all of those who so willingly contributed toward whatever progress the Association may have made during the past year, and to bespeak for your continued cooperation with the present administration.

J. Lester Hayman

---

Dr. Curtis H. Waldon, Dean of the School of Pharmacy of the University of Montana, has been appointed Director of Educational Relations with the American Council on Pharmaceutical Education, effective September 1, 1949. In the meantime, Dr. Edward C. Elliott will continue to serve the Council in that capacity.

## The Editor's Page

Oklahoma University Pharmaceutical Association held its Fifteenth Annual Convention on March 11. This association is unique in its organization in that it is patterned after that of the American Pharmaceutical Association. There are five subdivisions representing the various aspects of pharmacy. Each subdivision has its own officers and presents a program. All these programs are presented during the morning hours. The afternoon is given over to a general session. The annual banquet closes the day's program. This year, after the banquet, the awards were presented to the students by Dean Johnson and the affair closed with an address by the Honorable Milburn Cartwright, Secretary of State, The State of Oklahoma, who spoke on the subject, "The Secretary of State Looks at Pharmacy." The whole program is in the hands of the students, and it should have a real educational value. The Editor is of the opinion that it is well to have an adviser for our student organizations, but too frequently these organizations are dominated by the adviser. If a student organization is to have an educational value, it must be officered by students who are responsible for its conduct and its programs must be presented by students. Students have enough preaching to them done in the class room. The student organization should become a laboratory for extra-curricular activities of an administrative and intellectual kind. The Oklahoma University Pharmaceutical Association seems to have cut a pattern worthy of consideration by other groups.

---

Almost a quarter of a century has passed since Dr. W. W. Charters made the statement that "A well-informed pharmacist is the best single individual to disseminate information about public health." That statement was the result of the functional study which Dr. Charters was responsible for and which he directed in order to find out pharmacy's place

in society. It was a declaration that pharmacy was a public health profession. Many of us thought it was, but Dr. Charters assembled the evidence. We have paid little attention to it, in spite of the fact that Dean Rudd has constantly kept it before us in the pages of the *Virginia Pharmacist*. However, it did silence the "go slowers" that a four-year curriculum was necessary for the education of the pharmacist if he was to practice his profession intelligently. Of course, the attitude of the Committee on Special Training of the War Department in the first world war helped that idea along too.

---

Since Fighting Bob Fischelis became general secretary of the American Pharmaceutical Association, he has never been found asleep at his post. He has put forth Herculean efforts to make pharmacy a factor in all those agencies that have as their objective the improvement of public health and welfare. As a matter of fact, we would place this fact at the head of his accomplishments. But Dean R. L. Crowe, of the School of Pharmacy of the University of Tennessee, is doing something about it too. Some time ago, the Dean received a letter from the Chief Surgeon of the Cancer Department of the medical school regarding two patients that had reported to the Cancer Clinic the previous week. They had been referred to the clinic by graduate pharmacists of the school of pharmacy. An inquiry from the Editor is responsible for the statement from Dean Crowe "That the patients had called on these pharmacists for some simple treatment for the growth. Through educating our students by having clinical cases appear before them, with one of the cancer men to demonstrate and acquaint them with the danger that these apparently harmless looking conditions might lead to, proper diagnosis and treatment might be started early." Dean Crowe said further, "I would like to say also that in addition to the Cancer Clinic that we have a man in the VD Control Department of the university who also shows the students clinical cases and acquaints them with the dangers of counter prescribing, and the necessity of sending them to the proper authority for treatment.

We believe we are accomplishing a great deal of good in our School of Pharmacy by giving four or five of these clinics from each department each year to the graduating class. It seems to make an impression on them that is lasting and beneficial to all concerned." We approve of Dean Crowe's constructive experiment in pharmaceutical education. It should furnish food for thought for those fossiliferous (this refers to the physiological not the chronological age) members of the teaching profession who still think there is danger of the pharmacist knowing too much. These individuals need to study pharmaceutical history. At least they ought to go back to the Commonwealth Study when Dr. Charters in discussing the strategic position which the pharmacist occupies as a disseminator of information about non-communicable diseases stated, "The easy and summary disposition to make of this possible function of the pharmacist—the dissemination of information about non-communicable diseases—is drastically to prohibit all advice upon the part of the pharmacist, and to keep him in complete ignorance of the nature of disease. A method of procedure of much greater promise, however, is to teach the pharmacist more about the nature of disease with the full expectation that when he knows more about the dangers involved, he will increasingly refuse to give advice about complex diseases. Possibly the cure for counter-prescribing is not greater ignorance but more knowledge." The "Tennessee Experiment" may also furnish food for thought for those who think a program that was sufficient for the education of a pharmacist seventeen years ago is sufficient for today.

---

With the permission of Mr. Eli Lilly, we are quoting from a Lilly advertisement which ran in the pharmaceutical press during February. It reads as follows: "Progress in the profession of pharmacy is improving the pharmacist's position as a key factor in the nation's health. As in other professions, with success there naturally comes prestige and added responsibilities. Today, keeping abreast of medical research, dispensing, disseminating accurate information to physicians and the public, and providing complete prescrip-



tion service are the pharmacist's full-time obligations. Pharmacists and pharmacy will continue to grow and achieve in proportion to their acceptance of these essential functions."

It should be noted that in this advertisement, the manufacturer is addressing the retail druggist. This advertisement was not written for the student who is planning on going into manufacturing or research or pharmaceutical education. The manufacturer for his own service has for a long time insisted on men with longer training than a student gets in the four-year undergraduate course. How the retail pharmacist can "accept these essential functions" without a longer period of basic and professional training in these forward sweeping days of medical, dental, veterinary, and agricultural science is beyond the comprehension of some of us. In reading the discussions which have appeared in the press by those who are opposed to a longer period for the educative process for the retail druggist, I have yet to find a single argument that was not advanced years ago against going from a two-year high school course to a four, and against going from a two-year college course to a three, and against going from the three-year college course to a four. A new horizon has been set for pharmacy. What we now need are men of vision to challenge its objectives.

---

It has been reported that at least in one locality no enthusiasm has been found either among pharmacists or educators for a longer period of training for the retail pharmacist. This must have been in some place back east, where fog and smoke dim the vision. It is not true in the far west where educators and retail druggists and even the students have gone on record favoring a longer period of training. Perhaps Horace Greely was right when he said, "Go West, young man, go West," and perhaps Bishop Berkeley was right when in an Essay on the Prospect of Planting Arts and Learning in America he said—"Westward the Course of Empire Takes its Way," and perhaps John Quincy Adams was right when in an oration at Plymouth in 1802 he said—"Westward the Star of Empire Takes its Way," and there

is no question at all but that Solomon was right when he said, "A people without a vision will perish." Likewise, a profession with a leadership without a vision will perish.

---

Hardly a quarter passes in which we do not have to record the passing of men who have rendered invaluable services to pharmaceutical education. This time, we announce the passing of two stalwarts, Dr. Leasure K. Darbacher of the University of Pittsburgh, and Dr. Townes R. Leigh of the University of Florida. Dr. Darbaker was one of those quiet, self-effacing men who exerted his greatest influence in the classroom and in his contacts with students in their various organizations and in his associations with them as he led them on numerous occasions through the country side collecting material for study. It is for this personal contact that students will remember him as a helpful and inspiring teacher.

Dr. Leigh was a pillar of pharmaceutical education. The best years of his life were devoted to the building of a school of pharmacy in a great university. He rendered leadership in every phase of pharmaceutical education including the presidency of the American Association of Colleges of Pharmacy. As a member of the American Council of Pharmaceutical Education his services were outstanding. He was often criticized because he was not pharmaceutically trained, which was as puerile as to condemn a man because he was not born a woman. He brought to pharmaceutical education the culture and dignity of a college of liberal arts of a great university. When the contribution of the college of liberal arts to professional education is written, Townes R. Leigh will come into his own.

Rufus A. Lyman

## Notes and News

**Alabama Polytechnic Institute**—A committee composed of G. W. Hargreaves, pharmacy; R. B. Sutton, education; C. P. Anson, economics; J. L. Seal, Botany, and G. A. Schrader, chemistry, has been appointed by Dr. David C. Mullins, director of instruction, to study the findings and recommendations of the Pharmaceutical Survey. The first organized meeting was held March 17th and the recommendations of this committee will be used in the revision of the present pharmacy curriculum.—Prof. Joe M. Rash has been appointed associate professor of pharmacy to succeed Prof. A. F. Nickel who has purchased the Dumas Apothecary at Foley, Alabama. Prof. Rash is a graduate of Carson Newman College. He had had wide experience as a public school teacher. After graduating in pharmacy, he served for several years as assistant state toxicologist in Alabama.—Ten students were recently elected to Rho Chi and two to Phi Kappa Phi.

**University of Buffalo**—Dr. Leroy C. Keagle, formerly assistant professor of chemistry at Rutgers, has joined the staff as professor and head of the department of pharmacy. Dr. Keagles' undergraduate training was at Rutgers and his graduate, at the University of Maryland. He held a post doctorate fellowship at Purdue during 1944-45 and since that he has been on the staff of Rutgers.—Dr. Frederick O. Bissell, assistant professor of English, has been recalled to active duty with the Navy at the Brooklyn Navy Yards, and has been granted a leave of absence until July 1, 1949.—The Omega chapter of Rho Chi has recently inducted ten members.

**Cincinnati College of Pharmacy**—Prof. Simon Mendelsohn has been chosen to contribute the articles dealing with embalming fluids and preservatives for the Encyclopedia of Chemical Technology, which is being sponsored by faculty members of the Brooklyn Polytechnic Institute.—A large number of changes have been made in the pharmacy building which improve offices for the faculty, laboratories, library, and storage rooms.—Women faculty members recently conducted a food sale, the proceeds of which were used to purchase uniforms for the basketball team.

**University of Connecticut**—Dr. Joshua M. Leise has been appointed lecturer in bacteriology for the course being given during the spring session.—At a recent meeting of the student branch of

the A.Ph.A., Dr. Donald M. Skauen, assistant professor of pharmacy, addressed the group on the subject of "Hospital Pharmacy."—Recent speakers in the series of special lectures for seniors were John Murray of Parke, Davis and Company, Dr. William T. Strause of Hoffman-LaRoche, Dr. M. William Amster of Schering Corporation, and Dr. C. Paul Silrie of Merck and Company.—Alpha Lambda chapter of Phi Delta Chi was installed at the college on February 10. Grand Secretary Rand P. Hollenback was present, and delegations were there from the Massachusetts, the Albany, and the Philadelphia colleges of pharmacy. There were fifteen charter members.—Dr. Ernst Little, President of the American Pharmaceutical Association, addressed the student body at a convocation held in February.—A refresher course for pharmacists is being conducted during April and May for the third consecutive year. The lectures and demonstrations are conducted by Messrs. Fenney, Jannke, and White.—A bill is now before the Connecticut legislature which proposes the expenditure of \$750,000 for a new pharmacy building and equipment. If approved, it will mean the removal of the pharmacy school from its present location in New Haven to the university campus at Storrs.

**University of Florida**—The status of the School was changed to that of a College on February 7.—Dr. George A. Valley, of Bristol Laboratories, spoke on "Antibiotics" before the student body on February 15.—Dr. E. L. Newcomb, of the American Foundation for Pharmaceutical Education, addressed the students on March 1.—Dean P. A. Foote addressed the Gainesville Rotary Club on the subject "New Drugs" on March 15.—Dr. C. H. Johnson spoke on a local radio program March 1 on the subject "Some Notes on Medicinal Plants."

**Fordham University**—Rev. Robert I. Gannon, S. J., retired as president of the university at the close of the first semester, and was succeeded by the Rev. Lawrence J. McGinley, S. J. The new president has revealed a planned building program which would eventually include a medical school and medical center which would require approximately a \$25,000,000 fund.—Dean James H. Kidder has been elected vice president of the New York Branch of the American Pharmaceutical Association.—Modern offices, animal rooms, and a pharmacognosy laboratory have replaced those recently destroyed by a \$60,000 fire.—Mr. Leslie C. Jayne, secretary of the New York Board, spoke before the student branch in March. his topic being, "The New Type Examinations."

**George Washington University**—The District of Columbia Pharmaceutical Association Association has begun a campaign to raise

\$25,000 for the development of pharmaceutical education in the District of Columbia through the George Washington University School of Pharmacy. The Association has committed \$1,000 as the first pledge in the drive. The recommendation for the campaign was made in a recent report by the Association's Committee on the School of Pharmacy. The committee is also studying The Pharmaceutical Survey with particular attention being devoted to the recommendations concerned with the pharmaceutical curriculum and the "in-service professional instruction of the practicing pharmacists." The committee's recommendations, as they relate to the professional requirements for the practice of pharmacy in the metropolitan area of Washington, will be reported to the administration. Semi-annual inspections of the school will be made by the committee, which will report its findings to the administration and to the District Association each year at its annual convention.—The seminar lectures for senior students are being held during the current term, with a staff of lecturers distinguished in various pharmaceutical fields.—Three students received the bachelor's degree at the winter convocation.—Edward Monroe Nelson was graduated with distinction.

**University of Georgia**—The student branch of the A.Ph.A., at the February meeting, was addressed by Dr. B. O. Williams of the sociology department on the subject, "The Drug Store As A Social Center."—In March, Rho Chi sponsored an address by Dr. George A. Valley, senior bacteriologist of the Bristol Laboratories, before the pharmacy students and the University Science Club. His topic was "Antibiotics—Present, Past and Future."—On March 4, Dean K. L. Waters and Profs. F. F. Millikan, and K. Redman attended a branch meeting of the American Chemical Society in Atlanta.—A new course in animal health products and one in undergraduate research problems have been added to the curriculum.

**Howard College, Birmingham**—Because of high scholastic standing made during the fall quarter, Viola Fuson and Xanthi Hahamis have been awarded aid by the American Foundation for Pharmaceutical Education for the winter quarter.—Opaque visual equipment has been purchased by the Division of Pharmacy to assist students in deciphering the prescription in the dispensing laboratory.

**Idaho State College**—The Alpha Zeta Chapter of Phi Delta Chi held its annual dinner on January 14, at which Senior Keys were presented to the graduating seniors.—The students have inaugurated a quarterly news publication which they have named "Refill."—The department of physiology and pharmacology under the direction of Prof. Carl Reidisel has been fully equipped with new laboratory apparatus. The department also provides the courses for the stu-

dents in liberal arts.—Dr. Rufus A. Lyman, Jr., professor of biological sciences and lecturer in pharmacy, has been appointed the college staff physician.—The equipping of a laboratory for manufacturing pharmacy is about complete and plans are now being made to increase the space for the balance room and the laboratory for organic medicinals.—Profs. Roscoe, Rowland, and McArthur attended the meeting of District 7 at Missoula, Montana, in March. The District went on record adopting a five-year pharmacy program effective in 1951-1952.—Prof. Rowland represented the college at the symposium on antibiotic research held in Washington, D. C. in April.

**The State University of Iowa**—The college was host to the Iowa Chapter of Sigma Xi on the evening of March 9. Prof. J. W. Jones and Gail A. Wiese discussed the use of organic mercurial compounds in medicine with special emphasis on several compounds that have been synthesized in our research programs and studied for their diuretic activity. Robert L. Van Horne discussed water soluble waxes in relation to their use in botanical technique.—One hundred and sixty-four men and eighteen women registered for the current semester at the undergraduate level. Nine men and two women are registered for graduate work in the pharmaceutical area.—The annual Prize Prom, sponsored by the student branch, was held in March. Many attractive and valuable gifts were donated by numerous pharmaceutical and allied manufacturers and wholesale firms for distribution to students.—On April 6, Secretary John F. Rabe of the Iowa Pharmaceutical Association addressed the student branch on the subject "Legal Pharmaceutical Rules and Regulations in Iowa."—A Kent "Super-Three" roller type ointment mill has been received for use in the manufacturing laboratory.

**University of Kansas**—Plans for a science building to include pharmacy and chemistry are before the Kansas legislature.—An additional appropriation of \$2,431 for research equipment was granted to the school at the beginning of the spring semester.—Dean J. Allen Reese has recovered from a recent illness which kept him away from the university for about a month.

**The University of Kansas City**—Fifteen students were graduated at the close of the first semester.—The student branch celebrated National Pharmacy Week by placing several displays at strategic points on the campus.—Dr. Willard M. Hoehn addressed a group at the University of Kansas recently on "Compounds That Influence the Flow of Bile."—Dr. C. L. Campbell of the Lederle Laboratories recently gave a series of lectures on veterinary pharmacy for the juniors and seniors.—More than 200 students registered for courses for the second semester.



**Long Island University**—Prof. Ralph H. Cheney, department of biology, has recently been elected corresponding secretary of the Council of the New York Academy of Sciences, New York City, and a member of the Council of the American Association for the Advancement of Science.

**University of Michigan**—Paul E. Norris, who will soon receive the Ph.D. degree from the graduate school, has been appointed instructor in pharmacy.—The college is now located entirely in the new quarters in the new addition to the chemistry building.—\$9,000 has been allotted for additional equipment.—Drs. Worrell and Cataline recently took part in the Flint and Kalamazoo "Back to School" programs conducted by the Michigan State Pharmaceutical Association.

**University of Minnesota**—On January 25, the faculty met with the members of the board of pharmacy at the Nicollet Hotel to discuss mutual problems and policies.—Dr. Charles V. Netz was appointed to the State Board of Health and Vital Statistics for a 3-year term beginning January, 1949.—Rand P. Hollenback, of Phi Delta Chi, visited the local chapter on February 26.—The Twelfth Continuation Study Course in Pharmacy was given in the Center for Continuation Study on February 14-16. Guest lecturers were Dr. H. George DeKay of Purdue, Dean Floyd J. LeBlanc of South Dakota State, and Dr. Robert L. Swain of New York. On February 15, Dr. Swain addressed the northwestern and student branches of the A.Ph.A., and on the evening of February 16 he gave the annual Samuel W. Melendy Memorial Lecture in the Center for Continuation Study.—Two new large fume hoods are under construction in the laboratories. They will be equipped with all facilities necessary for modern research.—Two new senior elective courses, one on veterinary pharmaceutical products and one on insecticides and fungicides, are being offered this year.—Prof. Ragnar Almin is revising a dental formulary booklet for the Minnesota State Pharmaceutical Association.—A second one-day course on cancer detection for pharmacists is tentatively scheduled for the Center of Continuation Study on June 9.—Major John V. Painter, a graduate of this college, was recently appointed Chief, Pharmacy Supply and Administrative Section of the Medical Service Corps of the U. S. Army.—Dr. Netz was installed as first vice president and Dr. Hadley was re-elected secretary of the Minnesota State Pharmaceutical Association at the March Meeting.—Work is underway on the installation of new fluorescent lighting fixtures throughout Wulling Hall.

**Montana State University**—The meeting of District No. 7 was held at the University on March 11 and 12.—Twenty-one students recently participated in a trip to the firms of Lilly, Parke-Davis, and the Abbott Laboratories.—The school is on the legislative agenda for a medicinal plant greenhouse and an animal house.

**University of North Carolina**—In January, Dr. E. A. Brecht attended the meeting of the Committee on National Formulary.—Eleven pharmacy students completed the Instructors' Course in Red Cross First Aid on a voluntary, non-credit basis.—Fourteen students were initiated by the Xi Chapter of Rho Chi.—Rho Chi recently sponsored a lecture by Dr. George A. Valley, Bristol Laboratories.—Several programs were given recently by student organizations in competition for a \$25 prize offered by the student branch of the North Carolina Pharmaceutical Association.—Dr. W. H. Hartung addressed the Elisha Mitchell Scientific Society recently on "cis- and trans-Tropanol."

**North Dakota Agricultural College**—Twenty-seven juniors and two seniors were initiated into Rho Chi the current quarter.—Plans are underway to further the study of volatile oil production the coming summer. A large plot of ground has been obtained for that purpose.—Several upper classmen visited the Lilly plant during the spring vacation.

**Ohio State University**—Xi Chapter of Kappa Psi has been re-organized, and fifteen new members have been initiated.—Recently received new equipment includes: a large size Stokes granulating oven for tablet granulation; cataphoresis outfit; portable ultra-violet lamp; a drying oven; a precision incubator; kymographs; a high-speed centrifuge; a thermograph; a refrigerator and some miscellaneous pharmacological equipment. The university is celebrating its Seventy-Fifth Anniversary this year. The various departments and colleges are arranging separate programs. The college of pharmacy has selected May 11, 12, and 13 and arranged a program to cover the entire three days with a number of distinguished speakers as guests.

**Oregon State College**—Forty-three students and three faculty members of Oregon State College made an educational tour of four pharmaceutical manufacturing plants in the midwest recently.

**Philadelphia College of Pharmacy**—In December, 1948, Dr. Arthur Osol addressed the Philadelphia Branch of the A.Ph.A. on the subject "Chemical Instrumentation."—Prof. E. H. MacLaughlin has been appointed deputy district governor of District 14 of the International Association of Lions Clubs.—Three hundred graduates and

their wives attended a recent dinner given in honor of Prof. Freeman E. Stroup who is now in his fiftieth year of teaching. An oil portrait of him was presented to the school by the class of 1948.—Two new library murals depicting the evolution of writing have been given by two trustees, E. Fullerton Cook and William E. Ride-nour.—A freshman scholarship covering tuition and fees, presented by the Breyer Ice Cream Company, is available for the session of 1949-1950.—The seminars formerly offered to graduate pharmacists will be resumed the coming summer.—Dr. Paul C. Olsen is the author of the sections on drug retailing and drug wholesaling in the "Handbook of Cost Accounting Methods" recently published by Van Nostrand.

**University of Pittsburgh, School of Pharmacy**—The Pittsburgh branch of the A.Ph.A. held its first annual seminar in February. The program was conducted largely by members of the faculty of the University of Pittsburgh aided by representatives from Duquesne University and the Buffalo District of the F.D.A.—At the January meeting of the Alumni Association, Dean Edward C. Reif, assisted by a number of faculty members, presented a skit depicting the events which transpire in his office when a student presents himself for registration. Material was also presented which would be helpful to the student as a guide through the years of his academic career.

**Rutgers University, College of Pharmacy**—A panel discussion was held recently by the Student Branch of the A.Ph.A., the subject of which was that part of The Pharmaceutical Survey report which deals with the proposal of a six-year pharmaceutical curriculum. Several retail druggists, the faculty, and the student body were represented on the panel.—Ten students were recently elected to Rho Chi.—"Merits of Modern Drugs" was the subject of the fifth annual seminar which was held in March. The speakers were Drs. Lloyd K. Riggs, Harvey B. Haag, K. G. Kohlstaedt, and Richard A. Deno.

**University of Southern California**—Dean Alvah G. Hall recently addressed the pharmacists in the San Joaquin Valley on the subject of "Legislation affecting the Profession."—Dr. John L. Voigt, taking as his topic, "Curare, Its History and Modern Clinical Applications" was speaker at a recent meeting of the American College of Pharmacists, a local professional organization, which was started by a group of practicing pharmacists engaged in strictly professional pharmaceutical activities.—Dr. Morris M. Wolfred, Ph. D. University of Washington, has joined the staff of the pharmacology department.—Edward S. Brady, recently addressed the San

Gabriel Valley Pharmaceutical Association on "The Anti-Histamine Drugs."

**Temple University**—Dr. Carl D. Anderson, president of The Society of Sigma Xi, and Dr. William H. Taliaferro of the University of Chicago, were the recipients of the honorary degree of Doctor of Laws at ceremonies attending the installation of the 102nd chapter of Sigma Xi at Temple. Dr. Anderson gave the installation address in the dental-pharmacy building, his subject being "Elementary Particles of Matter." The ceremonies were participated in by the sixty-two members of the Temple faculty who belong to Sigma Xi.

**University of Texas**—Fred Borth, instructor in pharmacy, has resigned to enter retail pharmacy, and his place has been filled by Arthur Radcliffe, a recent graduate.—C. W. Wood, a pharmacy junior, has been elected to the 51st Texas Legislature from the 30th district.—In addition to the student branch of the A.Ph.A., the student body has organized a student branch of the Texas State Association.—\$1,250,000 has been allotted by the board of regents for the construction of a four story pharmacy building, and plans are being drawn by the architect. \$1,000 has been presented to the college by the Alcon Laboratories of Fort Worth to be used at the discretion of the faculty, and a gift of \$100 has been given by an anonymous alumna to be presented to an outstanding woman student.—Seven students have been elected recently to Rho Chi.—Dr. C. O. Wilson presented a paper on "State Board Examinations in Chemistry" at the New Orleans meeting of District No. 6, in March.

**Union University**—Contracts have been awarded for the construction of a new modern library capable of seating approximately 65 students at one time.—Dr. Fabian Lionetti has resigned from the chemistry staff in order to enter the industrial field.—The newly formed student branch was recently installed by Dean H. G. Hewitt of Connecticut. A total of 128 students are now members of the branch.—Arthur S. Wardle, president of the board of trustees, was awarded the honorary degree of Doctor of Laws at the midwinter commencement of Union College in Schenectady.

**Medical College of Virginia**—Dr. S. S. Negus has been elected president of the Virginia Academy of Science. F. P. Pitts is local chairman for the Science Talent Search, and is assisted by Drs. Kaufman, Hughes, Neuroth, and D. Smith. Drs. Smith, Kaufman and Neuroth, in company with the officers, have attended several district meetings of the state pharmaceutical association.—Seventy-

four attended the final dinner of District No. 2 at the Richmond meeting.—Miss Branson, hospital pharmacist, has resigned, and Mrs. Lollie Smith, a graduate of the University of Georgia, is replacing her. J. Y. Thomas has also resigned to enter retail pharmacy.

**West Virginia University**—On January 28 the Alpha Mu Chapter of Rho Chi was installed at this school with seven senior students and two members of the faculty as charter members. Two scholarships have already been established by the chapter. One is an engraved cup and the other a U. S. Dispensatory to be given to a freshman and a sophomore student maintaining the highest scholastic average in their respective years.—The student branch has increased its membership forty-five percent this year. The outstanding speaker on this year's program was Dr. George A. Valley of the Bristol Laboratories, who discussed the subject of Antibiotics.

**State College of Washington**—Thirty-eight students recently made their first trip to the Lilly, Parke-Davis, Abbott, and Upjohn plants. They were accompanied by students from Oregon State and the University of Montana.—Rho Chi has a pledge class of 22 upper classmen.—The Women's Auxiliary of the Washington State and the Women's Auxiliary of the Spokane Retail Druggists' Association have each given \$50 as a scholarship award for a deserving student.—Dr. P. H. Dirstine is convalescing from an attack of virus pneumonia.

**University of Washington**—Dr. Paul R. Rasanen has resigned as an instructor in pharmaceutical chemistry in order to join the research staff of Abbott Laboratories.—Dr. H. A. Langenhan attended the meeting of the U.S.P. Convention Nominating Committee in New York on March 21.—The department of pharmacy has inaugurated a Drug Service Division which will furnish medical supplies to the newly created Healy Science Division of the university. Participating groups are the infirmary, medical, dental, and nursing schools.—Dr. L. Wait Rising represented pharmaceutical education at a banquet given in Vancouver, B. C. by the Provincial Pharmaceutical Association in honor of the University of British Columbia's first graduating class in pharmacy on March 25.—Dr. E. M. Plein is to be a guest lecturer at the British Columbia Pharmaceutical Summer School during the week of June 6-11.—Twenty-one upper division students visited the plants of Lilly and Abbott and the Rosenwald Museum of Science and Industry, during spring vacation.

**Wayne University**—The University now has what has been termed a teaching unit in the Detroit Receiving Hospital, pharmacy being a part of that unit. The Committee on Therapeutics of the hospital was reorganized last September with Dean Lakey and Pat Cole as members. Part of the Committee's work now under way is the preparation of a new hospital formulary.

**Western Reserve University**—Dr. Frank H. Eby, grand regent of Kappa Psi, officiated at the recent reactivation of Beta Beta Chapter. Charles A. Young, president of the Ohio State Pharmaceutical Association acted as toastmaster at the dinner festivities.—A two-day institute was held on February 10 and 11, sponsored by the school and the several pharmaceutical organizations of Greater Cleveland. It was attended by 250 retail pharmacists, manufacturers, and educators. Among the outstanding speakers present were Dr. Ernest Little, Dr. Robert L. Swain, Dr. George D. Beal, Mr. Frank Moudry, Dr. E. L. Newcomb, Dr. George L. Webster, and many others from within and without the area.

**University of Wisconsin**—Dr. William O. Foye, DuPont research chemist, has been appointed assistant professor of pharmaceutical chemistry.—Mohit C. Gupta has been appointed as a research assistant to continue the research on application of the spray drying process to pharmaceuticals.—A centrifuge, a new pH meter, and other minor apparatus is being added to the facilities of the physical pharmacy laboratory.—Dr. Loyd M. Parks, in collaboration with Drs. Loyd E. Harris and Paul J. Jannke, has completed a text on inorganic pharmaceutical chemistry.—A new approach to questions of incompatibility and solubility, based on electronic concepts, has been worked out by Drs. Louis W. Busse, Takeru Higuchi and Dale E. Wurster, Wisconsin contributors to a forthcoming dispensing text to appear in the "American Pharmacy" series.—Undergraduate instruction in pharmacognosy is being revised and reorganized by Dr. Joseph V. Swintosky. In the plan, the study of morphology and the related laboratory work will be reduced in favor of a biochemical approach and classification utilizing visual aids, demonstration experiments, and increased emphasis on lecture material; also, emphasis will center on chemical composition and physico-chemical processes employed in isolation of active principles and preparation of dosage forms, and on the theoretical and applied aspects of stability problems with regard to currently useful drugs of biological origin.—A special instrumentation course is now being given by Dr. Takeru Higuchi to familiarize students with newer techniques, instruments, and theories useful in pharmaceutical research and control. Areas covered include spectrophotometric methods, characterization and



determination of pharmaceuticals, newer electrometric methods (e. g., conductometric, amperometric, and potentiometric), use of the polarograph, fluorometric applications, and use of the cylindrical viscometer.—Two additional courses have been approved for Graduate School credit: (1) extraction and absorption methods and the physical principles involved, and (2) colloids, suspensions and emulsions, and the theory basic to their technology.—During the second semester, Dr. George Urdang is offering a course in History of Pharmacopoeias for the first time. Course content covers development of drug standards from early times to the present, with an analysis of scientific, political and cultural forces reflected in the world's pharmacopoeias.—In March, Dr. Urdang addressed the Sigma Xi group at Abbott Laboratories, speaking on "Pharmacy as the Mother of Scientific Chemistry."

**University of Wyoming**—Prof. Jack N. Bone, on March 1, addressed the Wyoming Section of the American Chemical Society on the subject "The Blood Proteins and the Principles Involved in their Fractionation."—Dean David W. O'Day spoke recently before the Laramie Presbyterian Guild. He discussed the progress which has been made in the latter days in the development of some of the new drugs.—Ned Carlson, a sophomore pharmacy student, was one of the university students chosen to make a goodwill tour of the University of Utah in January.—The School of Pharmacy is preparing many of the preparations needed for the student health service.—Twenty-seven charter and two honorary (faculty) members were initiated at the installation ceremonies of the Alpha Mu Chapter of Phi Delta Chi on March 2. The installation was conducted by Rand P. Hollenbeck, national secretary of the fraternity.—Five new microscopes have been purchased for pharmacognosy, and a ten-foot capacity deep freeze unit has been installed in the general pharmacy laboratory. Additional equipment has also been acquired for the dispensing laboratory.—Mr. Edgar S. Bellis, president of the National Association of Retail Druggists, has appointed Dean D. W. O'Day a member of the National Committee on Socialized Pharmacy and Medicine.

## Miscellaneous Items of Interest

### Memorials

#### **LEASURE KLINE DARBAKER**

Dr. Leasure Kline Darbaker, Emeritus Professor of Pharmacognosy and Bacteriology, University of Pittsburgh School of Pharmacy, died on Sunday, February 6, 1949 of a heart attack at his home, 424 Franklin Avenue, Wilkinsburg, Pennsylvania. Services were held in Pittsburgh and Emlenton followed by interment at Emlenton, Pennsylvania.

Dr. Darbaker was born in Pittsburgh on January 13, 1879, the son of the late Rev. Dr. Henry D. and Agnes Kline Darbaker. After having attended the public schools of McKeesport and Emlenton and Grove City College, he became interested in pharmacy and in 1900 obtained the degree of Ph. G., from Ohio Northern University, followed in 1937 by the honorary degree of Sc. D., from the same institution. After attending the School of Pharmacy of the University of Pittsburgh, he received the Ph. G. degree in 1906, followed by the Phar. D. degree in 1910, both from the University of Pittsburgh. During the summer of 1908 he studied at the University of Berlin.

For about 40 years he was a member of the faculty of the School of Pharmacy, starting in 1907 as assistant in materia medica, pharmacognosy and bacteriology and in 1911 becoming professor of pharmacognosy and bacteriology. He was the author of several manuals used in his courses and a co-editor of Kraemer's Scientific and Applied Pharmacognosy.

Dr. Darbaker was a member of the A. Ph. A., P. Ph. A., and numerous other scientific associations and societies, having been a former president of the Pennsylvania Academy of Science (1937-1938), chairman of the Pittsburgh Branch of the A. Ph. A. and president of the Plant Science Seminar in 1937. He was a member of Kappa Psi, Pharmaceutical Fraternity, was Grand Historian from 1924 to 1937 during which term he assisted in the installation of the reactivation of many collegiate and graduate chapters of Kappa Psi. He was also a member of Psi Sigma Fraternity, a Mason and a member of the Independent Order of Odd Fellows.

He was an inveterate collector of specimens which he would have on display while teaching. Students will remember him as the leader of numerous botanical excursions and other trips. He liked to invite large groups of his friends to his home in Wilkesburg and another home he maintained in Emlenton where one of the features of entertainment was invariably the numerous movies taken by him of student trips and of outings of the Botanical Society of Western Pennsylvania.

Dr. Darbaker left no immediate survivors, his wife, the former Susan B. King, having died eight years earlier.

Stephen Wilson

---

#### **TOWNES RANDOLPH LEIGH**

On February 15, 1949, there passed from our midst the mortal body, but not the eternal spirit, of the beloved Townes Randolph Leigh.

The record of Dr. Leigh's accomplishments stands as a monument to him and will become more outstanding with the passage of time. The record needs no defense, as time will show. As head of the department of chemistry, his efforts led to the establishment of the College of Pharmacy at the University of Florida in 1923. He served as dean of that college for a decade, and in that time he was responsible for bringing it, by developing undergraduate and graduate work, to a point which classed it as one of the leading pharmaceutical teaching institutions in the United States. His energy and foresight were responsible for the construction and equipment of the chemistry-pharmacy building in 1927 and its enlargement in 1948.

In later years, as head of the department of chemistry, as acting vice president, and as vice president of the University, his interest in the College of Pharmacy was sustained and helpful, and his contributions to science in his field were valuable in peace and in war. At the time of his death, he was dean emeritus of the College of Arts and Sciences and head of the chemistry department and honorary vice president of the University.

On the national level, Dr. Leigh was a member of many scientific and professional organizations. He held membership on many committees of the American Pharmaceutical Association and the American Association of Colleges of Pharmacy, and was

president of the latter organization in 1928-31. In all of these positions, he rendered a significant service, but the most far-reaching of all was the service he rendered to pharmaceutical education as a member of the American Council on Pharmaceutical Education during the years 1932-1946. Because of his grasp of pharmaceutical education and its relation to other fields of professional education and to general education, and because of his superior judgment, he made a contribution to the work of the Council that will be lasting. He was a member of the Baptist Church, and held membership in numerous civic, fraternal, and religious organizations, and wherever he cast his lot, he served with distinction.

Once Dr. Leigh said to the writer—"You must get a lot of satisfaction knowing that for every meeting you attend, pharmaceutical education is better off for your having been there." I hope that statement is true, but I felt embarrassed. No finer statement than that one of his own coining could be made to express the service of Townes R. Leigh, himself. We want to assure Mrs. Leigh that she is not alone in these days of her sorrow, and she is not alone in anticipating the joy of the future homecoming.

Rufus A. Lyman

---

President W. G. Leutner of Western Reserve University has announced the discontinuance of the university's undergraduate and graduate program in pharmacy as of June 30, 1949. He states that following an intensive study by the administrative officers and the Executive Committee of the Board of Trustees, and when an earnest effort on their part to find sufficient financial support, locally and nationally, to enable them to continue the school on a high professional level, had failed they were unwilling to continue the school in the face of the critical financial problems, for to do so must mean the lowering of standards that would inevitably be to the discredit of both the university and the profession. The administrative officers are now concerned about the relocation of the pharmacy students and staff and requests the sympathetic cooperation of other schools and of organizations that may be approached by students and staff members. We can assure President Leutner any such individuals will be given help in every possible way.

## Book Reviews

**Laboratory Guide in Pharmacology for Pharmacy and Dental Students** by Harald G. O. Holck, B.S., Ph.D., Department of Physiology and Pharmacology, the University of Nebraska, 1949. 144 pages. Illustrated. Burgess Publishing Co. Price \$2.75.

We hail with delight the appearance of a laboratory guide in pharmacology that is adequate for teaching a standard course in pharmacology. The guide is prefaced by a statement of the objectives to be attained in laboratory teaching. They are:

- (a) To familiarize the student with the appearance and properties of many of the principal drugs.
- (b) To teach how these drugs may be dispensed through the medium of the prescription.
- (c) To demonstrate methods of administration of drugs and to furnish the student an opportunity to perfect himself by actual practice with the technical aspects of these procedures.
- (d) To determine by experiment how drugs modify normal or altered physiological processes by selective stimulation or depression, or by irritation.
- (e) To study the principal methods of detoxication, excretion, and elimination of drugs.
- (f) To become acquainted with the actions of certain toxic substances which, although not used in therapeutics, are important as industrial or health hazards.
- (g) To learn to cooperate with other members of a group in preparing a special experimental project and demonstrating it to the other students of the class.

This statement is followed by general directions to the student as to how to equip himself for laboratory work; what care must be taken in the handling of experimental animals; what he must do to prepare himself for the experiment in the pre-laboratory period in order to make it successful and how to keep records and notes and evaluate observations and draw conclusions which will make the performing of the experiment have a permanent value.

Then follows a series of forty-five experiments which cover the whole field of drug action, including methods of administration, drug antagonism, poisoning and antidotal treatment. Many of

the experiments are followed by a brief list of references which will be helpful to the student in interpreting the results. The essential pieces and set ups of laboratory apparatus are illustrated by line drawings which are well executed and so perfectly clear that confusion in the student's mind is impossible.

Following the experiments is an addendum which deals with the methods of determining the margin of safety (therapeutic index).

The author has a keen sense for selecting experiments which have dramatic teaching values and the guide is evidence of years of successful laboratory teaching. The guide is a real contribution as a teaching tool to pharmaceutical literature and will do much toward unifying and standardizing pharmacological laboratory work. It offers a standard around which laboratory equipment may be built. Too long teachers have tried to build a guide around the equipment of individual laboratories.

The publishers are also to be commended for undertaking the publication of such a guide and presenting the material in a dignified and permanent form. Mimeographed laboratory guides on cheap paper are considered ephemeral by the student, and he consigns them to the waste basket as soon as the course is completed and he knows his grade is recorded. It pays to put a laboratory guide in such a form and dress that a student can have respect for it.—R.A.L.

**Quantitative Pharmaceutical Analysis** by Alvin H. Voight, Jr., Department of Chemistry, University of Colorado, 1942. 211 mimeographed pages bound in pasteboard. Distributed by the University of Colorado Bookstore at Boulder.

General notes and laboratory experiments covering the field of quantitative pharmaceutical chemistry. It presupposes that the student has had the basic courses in general analytical and organic chemistry. Its several sections deal with such subjects as hydrogen ion concentration and pH; indicators acidimetry-alkalimetry; extraction procedure; oxidation reduction; precipitation optical activity; and special determinations. Procedures for the preparation of standard solutions are given, as well as several official type assays and problems to test the student's mastery of the subject.

**Essentials of Public Health** by William P. Shepard, Third Vice President, Health & Welfare Division, Metropolitan Life Insurance Company; Clinical Professor of Public Health & Preventive Medi-



cine, Stanford University; Charles E. Smith, M.D., D.P.H., Professor of Public Health & Preventive Medicine, Stanford University; President California State Board of Health: Rodney R. Beard, M.D., M.P.H., Associate Professor of Public Health & Preventive Medicine, Stanford University; Manager, Medical Department, Pacific-Alaska Division, Pan-American World Airways; and Leon B. Reynolds, Sc.D., Professor of Hydraulic & Sanitary Engineering, Stanford University, with a Foreword by Ray Lyman Wilbur, M.D., L.L.D., Sc.D., Chancellor Stanford University; Ex-Secretary of the Interior, 1948. 600 pages. Illustrated, J. B. Lippincott Company. Price \$5.00.

The essential and basic problems of public health stated and discussed in a most easily readable style. The whole field from health agencies and organization to statistical methods and their analysis are presented in such a way that the professional student whether he be medical, pharmaceutical, or the sanitary engineer, can grasp the essential principle and relate his own special field to the problems of public health as a whole. Each chapter is followed by a list of references covering the specific field.

Now that pharmacy has become recognized as a public health profession, it is essential that we begin giving standard courses in the pharmaceutical curriculum. This book will serve as an excellent teaching tool.

**Quantitative Pharmaceutical Chemistry** by Glenn L. Jenkins, Ph.D., Dean, School of Pharmacy, Purdue University; Andrew G. DuMez, Ph.D., formerly Dean, School of Pharmacy, University of Maryland; John E. Christain, Ph.D., Associate Professor of Pharmaceutical Chemistry, Purdue University; and George P. Hager, Ph.D., Associate Professor of Pharmaceutical Chemistry, University of Maryland. Third Edition. 1949. 531 pages. Illustrated. McGraw-Hill Book Company, Inc. Price \$4.75.

This text is so well known that the announcement of a new edition will be received with satisfaction by teachers in this field, and the reputation of the authors is a sufficient guarantee of the excellence of the third edition.

**The Organization & Administration of Intramural Sports** by Louis E. Means, Professor of Physical Education & Director of the Division of Physical Education & Intramural Sports, University of Nebraska. 1949. 442 pages. 214 illustrations. The C. V. Mosley Company. Price \$5.75.

For those colleges of pharmacy that promote their own athletic program, it would seem that this is a valuable contribution to the field of intramural sports.

**Condensed Review of Pharmacy** by George W. Fierro, Ph.D., Ph.D., Technical Advisor to the President, Stanco Inc. 1949, Sixth Edition, 121 pages. John Wiley & Sons, Inc.

The purpose of the book is to furnish a ready review for pharmacy students and a ready reference for pharmacists and physicians. It covers pharmaceutical calculation, the official preparation of the U.S.P. and N.F., and a large amount of related medical information in tabular form. It is well constructed for the purpose intended.

**Eye, Ear, Nose & Throat Manual for Nurses** by Roy H. Parkinson, M.D., F.A.C.S., Head Oculist & Aurist to St. Joseph's Hospital, San Francisco. 1949. Sixth Edition. 259 pages, 82 illustrations, two in color. C. V. Mosbey Company. Price \$3.00.

The material discussed is arranged in three parts, the first for classroom use, the second for operating room technique and the third is intended to guide the public health nurse in the pursuit of her particular problems. It is easy reading and the illustrations show the cavities concerned and the application of the use of instruments is clear and practical and the discussions of the problems of the public school nurse are valuable to pharmacy students, and pharmacists will find much in it of value in acquainting them with the problems of a related profession.

**Pharmacology**—by J. H. Gaddum, Sc. D., F. R. S., M. R. C. S., Professor of Pharmacology in the University of Edinburgh, Edinburgh. Oxford Medical Publications. Third Edition. 1948. 504 pages with 75 illustrations. Oxford University Press, 114 Fifth Ave., New York 11. Price \$8.00.

Many changes have been incorporated in this new edition which increase its usefulness. Such "new" drugs as folic acid, the anti-coagulants, amino acids, BAL, antimalarials, sulfonamides, streptomycin, antihistaminics, diuretics, plasma proteins, detergents, and penicillin have been discussed.

Having been written in the United Kingdom, it is not surprising to find British Pharmacopoeia terminology which may be confusing to the average student in this country. For example, thiamine

hydrochloride is referred to as "aneurine hydrochloride." Some features which should be of value include a key to the interpretation of chemical names, a section dealing with therapeutic trials on man, a discussion on toxicity tests, a review of qualitative pharmacological analysis, and a section dealing with biological assay. Even though this book may not be suitable as a text for pharmacy students in this country, it would, nevertheless, serve an extremely useful purpose as a reference book for students studying pharmacology, bioassay, and toxicology.—W.R.B.

**Journal of Legal Education**—Published quarterly by the Association of American Law Schools and Edited for the Association by the Faculty of Law, Duke University, Brainerd Currie, Editor-in-Chief. Subscription price \$4.00.

Publication of the journal was begun with the September 1948 issue. A perusal of the first numbers justifies the statement Editor Currie made (Editor's Mail) when he requested an exchange with **The American Journal of Pharmaceutical Education**, to the effect that educational journals in two fields of professional education can be mutually helpful. The Editor has found this true in the case of the educational journals in the fields of medicine, dentistry, chemistry, and general education. In scanning its pages, we have been amazed at the similarity of the problems of those discussed in law and those that we have facing us as we enter upon the revamping of our curriculum to meet the requirements of the new horizon set by The Pharmaceutical Survey. It is to be hoped that the **Journal of Legal Education** finds its way into the libraries of our pharmacy schools.—R.A.L.

**Education for Professional Responsibility**—A report of the Proceedings of the Inter-Professions Conference on Education for Professional Responsibility held at Buck Hill Falls, Pennsylvania, April 12, 13, and 14, 1948. 1948. 207 pages. Carnegie Press, Carnegie Institute of Technology, Pittsburgh. Orders should be sent to Rutgers University Press, New Brunswick, New Jersey. Price \$3.00.

It is a matter of general knowledge among those who are engaged in professional education that there are many educational problems that are common to all professions. The purpose of this conference was to bring into the open, clarify, and discuss those problems for the express purpose of improving professional teaching. In order to limit the group to a size that would make personal contact and discussion possible, only 100 invitations were issued. The conference was limited to teachers in schools of divinity, medicine, law, engineering, and business science. Teachers from these schools

conceived the idea and planned the program. Invitations were issued to individuals who had shown special interest in improving professional education, and not because of their connection with any particular institution. The discussion covered three main areas: (1) The Objectives of Professional Education; (2) The Content and Method in Professional Education; (3) The Social and Humanistic Aspects of Professional Education. A brief bibliography, giving references on professional education in the five fields represented, is appended. The book should be studied by every pharmaceutical educator whether teacher or administrator. The problems discussed are our problems and the discussions reveal the secrets of effective teaching.—R.A.L.

---

The following is an abstract of the round table discussion on pharmacy at the 48th annual meeting of the Medical Library Association which was held at Galveston, Texas, on April 13. The report was written by Margaret E. Vinton of the St. Louis College of Pharmacy who moderated the round table discussion group on pharmacy. The group VOTED:

(1) To recommend that the Medical Library Association make every effort to acquaint the American Pharmaceutical Association, American Association of Colleges of Pharmacy, pharmaceutical research laboratories, schools of pharmacy, and professional library staff members with the opportunities and advantages of affiliation with the Association, as an organization representative of all medical sciences libraries; (2) To request the membership committee chairman to make a study of the possibilities of securing memberships from the accredited schools and colleges of pharmacy, and the pharmaceutical research laboratories as institutional members, and their librarians as professional members, when qualified, also to ascertain the reasons for the small attendance of pharmacy librarians at the annual meetings, and their apparent apathy in the activities of the Association.

The Eli Lilly Company scholarship grant was mentioned as a possible future source of aid in recruiting and training librarians for service in the field of PHARMACY.

Mr. J. A. MacWatt, of the Lederle Laboratories, suggested that the very low standards for pharmacy school libraries be brought to the attention of The American Council on Pharmaceutical Education, and the suggestion that the standards for dental school libraries might be considered a basis for improvement in the former.

Miss Emily McCurdy, of the University of Tennessee, suggested that as the once weak dental school libraries had been developed through the interest and support of the administrators and faculty members, the aid of corresponding persons in the pharmacy schools should be enlisted to improve their standards.

The chairman cited the new paragraph in the section on **The Library** in the November 1, 1948 revised standards of the American Council on Pharmaceutical Education for the accreditation of colleges of pharmacy, as evidence of the Council's interest in better libraries, also manifested in the appointment of a committee of three members, Dean Daniels, chairman, Jenkins and Christensen, by the Council "to prepare a form for the guidance of the colleges and this Council with respect to library needs" reported to her in a letter from the Council's Secretary on February 18th.

The need for a committee on pharmacy school library standards, comparable to the Joint Committee on Hospital, Medical and Nursing School Library Standards, was apparent, throughout the discussion.

The chairman suggested that in the meantime, pharmacy librarians could help greatly in the improvement of standards by familiarity with the standards for other professional libraries, by ability to submit specific recommendations when given an opportunity to do so, by emphasizing their professional services, and minimizing their routine, sem-professional, clerical chores, as much as possible, and by their abilities and enthusiasms exemplify the librarian of Dr. R. A. Lyman's ardent wish in the October, 1948, *American Journal of Pharmaceutical Education* \* \* \* "we need librarians imbued with something more than the details necessary for library care."

The need for some criteria in evaluating pharmacy school libraries, comparable to the tentative outline of the Committee on Criteria for Medical School Libraries, was mentioned, with agreement that the cooperation of the American Council on Pharmaceutical Education should be sought in the preparation of preliminary and final drafts of such criteria.

The chairman called attention to the proposed amendment Art. 11, Sect. 5, to the constitution of the American Pharmaceutical Association, on the Association's program that month, a statement in declaration of support of a system of licensure and registration for pharmacists, as an opportune measure that presumably would lend support of the Association to a system of certification for pharmacy librarians.

The all too apparent need for better indexing and abstracting of pharmaceutical reference literature was discussed at some length. Upon motion of Miss Lage, it was VOTED: (1) to commission the chairman, as a committee of one, to discuss with Col. McNinch, of the Army Medical Library's Committee of Consultants on Medical Indexing, the importance of indexes in the pharmaceutical reference material, including the house organs that report valuable research on discovery and development of new drugs and other medicinal products, and (2) to suggest to the Medical Library Association Executive Committee that it consider the propriety of calling to the attention of the American Pharmaceutical Association, in annual session scheduled April 24-30, 1949, the desirability of endorsement of the indexing project of the Army Medical Library, and the Committee on a Coordinated Abstracting Service for Clinical Medicine project under UNESCO auspices, with request for representation on advisory consultant committees, to assure adequate inclusion of pharmaceutical reference literature in the indexing, and abstracting of medical material in publication.

Other items on the conference program briefly noted as worthy of consideration if time permitted were recruiting, placement and internship.

---

In a recent study prepared for the Veterans' Administration by the Occupational Outlook Service, Bureau of Labor Statistics, U. S. Department of Labor, the statement is made that the next few years will see an increased demand for trained personnel in medicine and psychology. At the same time, competition will grow keener for positions in **pharmacy**. It is estimated that "about two-thirds of this years 5,543 medical graduates (from schools accredited by the American Medical Association) and all of the 1,515 dental graduates will be needed to replace the physicians and dentists lost to the field annually because of death or retirement." This will permit only a small expansion of the country's medical staff. The study states also that pharmacy graduates are in "strong demand" this year (1949), but larger graduating classes are in prospect for the next several years. The 1948 graduating class of 1,975 may be doubled in 1950.



# INSTITUTIONS HOLDING MEMBERSHIP IN THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY (Concluded)

## Nebraska

Creighton University, College of Pharmacy, Omaha, (1916)  
William A. Jarrett, Dean  
University of Nebraska, College of Pharmacy, Lincoln, (1913)  
Joseph B. Burt, Dean

## New Jersey

Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark, (1923)  
Thomas D. Rowe, Dean

## New York

University of Buffalo, School of Pharmacy, Buffalo, (1939)  
A. B. Lemon, Dean  
Columbia University, College of Pharmacy of the City of New York, (1939)  
Charles W. Ballard, Dean  
Fordham University, College of Pharmacy, New York, (1939)  
James H. Kidder, Dean  
Long Island University, Brooklyn College of Pharmacy, Brooklyn, (1939)  
Hugo H. Schaefer, Dean  
Union University, Albany College of Pharmacy, Albany, (1945)  
Francis J. O'Brien, Dean

## North Carolina

University of North Carolina, School of Pharmacy, Chapel Hill, (1917)  
Marion L. Jacobs, Dean

## North Dakota

North Dakota Agricultural College School of Pharmacy, Fargo, (1922)  
William F. Sudro, Dean

## Ohio

Ohio Northern University, College of Pharmacy, Ada, (1925)  
Rudolph H. Raabe, Dean  
University of Cincinnati, Cincinnati College of Pharmacy, (1947)  
Lyell Klotz, Dean  
The Ohio State University, College of Pharmacy, Columbus, (1900)  
Bernard V. Christensen, Dean  
University of Toledo, College of Pharmacy, Toledo, (1941)  
Charles H. Larwood, Dean  
Western Reserve University, School of Pharmacy, Cleveland, (1902)  
Arthur P. Wyss, Dean

## Oklahoma

University of Oklahoma, School of Pharmacy, Norman, (1905)  
D. B. R. Johnson, Dean

## Oregon

Oregon State College, School of Pharmacy, Corvallis, (1915)  
George S. Crossen, Dean

## Pennsylvania

Duquesne University, School of Pharmacy, Pittsburgh, (1927)  
Hugh C. Muldoon, Dean  
Philadelphia College of Pharmacy and Science, Philadelphia, (1900)  
Ivor Griffith, Dean  
Temple University, School of Pharmacy, Philadelphia, (1926)  
H. Evert Kendig, Dean  
University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh, (1900)  
Edward C. Relif, Dean

## Philippines

University of the Philippines, College of Pharmacy, Manila, (1917)  
Patrocinio Valenzuela, Dean

## Puerto Rico

University of Puerto Rico, College of Pharmacy, Rio Piedras, (1926)  
Luis Torres-Diaz, Dean

## Rhode Island

Rhode Island College of Pharmacy and Allied Sciences, Providence, (1926)  
W. Henry Rivard, Dean

## South Carolina

Medical College of the State of South Carolina, Charleston, (1940)  
William A. Prout, Director  
University of South Carolina, School of Pharmacy, Columbia, (1928)  
Emery T. Motley, Dean

## South Dakota

South Dakota State College, Division of Pharmacy, Brookings, (1906)  
Floyd J. Leblanc, Dean

## Tennessee

University of Tennessee, School of Pharmacy, Memphis, (1914)  
Robert L. Crowe, Dean

## Texas

University of Texas, College of Pharmacy, Austin, (1926)  
Henry M. Burlage, Dean

## Virginia

Medical College of Virginia, School of Pharmacy, Richmond, (1906)  
R. Blackwell Smith, Jr., Dean

## Washington

State College of Washington, School of Pharmacy, Pullman, (1912)  
Pearl H. Dirstine, Dean  
University of Washington, College of Pharmacy, Seattle, (1903)  
Forest J. Goodrich, Dean

## West Virginia

West Virginia University, College of Pharmacy, Morgantown, (1920)  
J. Lester Hayman, Dean

## Wisconsin

University of Wisconsin, School of Pharmacy, Madison, (1900)  
Arthur H. Uhl, Director

---

## FELLOWSHIPS IN PHARMACY

To meet the demonstrated need for trained teachers and researchers in the field of pharmacy, the American Foundation for Pharmaceutical Education announces a limited number of Fellowships for students seeking graduate degrees in pharmaceutical subjects.

These Fellowships are open to students (men or women) qualified for registration in approved graduate schools (or colleges) for one or more of the following major fields:

**PHARMACY**  
**PHARMACEUTICAL CHEMISTRY**  
**PHARMACOLOGY**  
**PHARMACOGNOSY**  
(or closely related subjects)

Each Fellow will receive from the Foundation a stipend to cover the year of his appointment, plus an allowance for tuition and miscellaneous term bills. Fellowships are renewable for one year.

For further information concerning Foundation Fellowships, including application forms, write directly to the

**Board of Grants,**  
**AMERICAN FOUNDATION FOR PHARMACEUTICAL**  
**EDUCATION**

**330 West 42nd Street**

**New York 18, N. Y.**

---